In the United States Court of Federal Claims

OFFICE OF SPECIAL MASTERS
No. 13-483V
(To be published)

TANISIA CUNNINGHAM, legal guardian of G.C.F.,	*	Filed: August 1, 2016
Petitioner,	*	
v.	*	Vaccine Act Entitlement; Autism Spectrum Disorder; Autoimmunity
SECRETARY OF HEALTH AND HUMAN SERVICES	*	
Respondent.	*	

Clifford Shoemaker, Vienna, VA, for Petitioner.
Voris Johnson, U.S. Department of Justice, Washington, DC, for Respondent.

DECISION

HASTINGS, ***Special Master***.

This is an action in which the Petitioner, Tanisia Cunningham, seeks an award under the National Vaccine Injury Compensation Program ("Program"),[1] on account of her son G.C.F.'s developmental disorder, an autism spectrum disorder, which she asserts has been caused or aggravated by an MMR (measles, mumps, rubella) vaccination administered on July 2, 2012. For the reasons set forth below, I conclude that Petitioner is not entitled to an award.[2]

[1] The applicable statutory provisions defining the Program are found at 42 U.S.C. § 300aa-10 *et seq.* (2012 ed.). Hereinafter, for ease of citation, all "§" references will be to 42 U.S.C. (2012 ed.). The statutory provisions defining the Program are also sometimes referred to as the "Vaccine Act."

[2] Although I have considered the entire record, including the voluminous medical records and medical literature, in arriving at my decision, I will only discuss evidence specifically relevant to resolution of this matter. *See Paterek v. Sec'y of Health & Human Servs.*, 527 Fed. App'x 875, 884 (Fed. Cir. 2013). This includes medical literature submitted by both sides.

I

THE APPLICABLE STATUTORY SCHEME

Under the National Vaccine Injury Compensation Program, compensation awards are made to individuals who have suffered injuries after receiving vaccines. In general, to gain an award, a petitioner must make a number of factual demonstrations, including showing that an individual received a vaccination covered by the statute; received it in the United States; suffered a serious, long-standing injury; and has received no previous award or settlement on account of the injury. Finally – and the key question in most cases under the Program – the petitioner must also establish a *causal link* between the vaccination and the injury. In some cases, the petitioner may simply demonstrate the occurrence of what has been called a "Table Injury." That is, it may be shown that the vaccine recipient suffered an injury of the type enumerated in the "Vaccine Injury Table," corresponding to the vaccination in question, within an applicable time period following the vaccination also specified in the Table. If so, the Table Injury is presumed to have been caused by the vaccination, and the petitioner is automatically entitled to compensation, unless it is affirmatively shown that the injury was caused by some factor other than the vaccination. § 300aa-13(a)(1)(A); § 300aa-11(c)(1)(C)(i); § 300aa-14(a); § 300aa-13(a)(1)(B).

In other cases, however, the vaccine recipient may have suffered an injury *not* of the type covered in the Vaccine Injury Table. In such instances, an alternative means exists to demonstrate entitlement to a Program award. That is, the petitioner may gain an award by showing that the recipient's injury was "caused-in-fact" by the vaccination in question. § 300aa-13(a)(1)(B); § 300aa-11(c)(1)(C)(ii). ("Causation-in-fact" is also known as "actual causation.") In such a situation, the presumptions available under the Vaccine Injury Table are inoperative. The burden is on the petitioner to introduce evidence demonstrating that the vaccination initially caused, or significantly aggravated, the injury in question. *Althen v. HHS*, 418 F.3d 1274, 1278 (Fed. Cir. 2005); *Hines v. HHS*, 940 F.2d 1518, 1525 (Fed. Cir. 1991). The showing of "causation-in-fact" must satisfy the "preponderance of the evidence" standard, the same standard ordinarily used in tort litigation. § 300aa-13(a)(1)(A); *see also Althen*, 418 F.3d at 1279; *Hines*, 940 F.2d at 1525. Under that standard, the petitioner must show that it is "more probable than not" that the vaccination initially caused or aggravated the injury. *Althen*, 418 F.3d at 1279. The petitioner need not show that the vaccination was the sole cause or even the predominant cause of the injury or aggravation, but must demonstrate that the vaccination was at least a "substantial factor" in causing or aggravating the condition, and was a "but for" cause. *Shyface v. HHS*, 165 F.3d 1344, 1352 (Fed. Cir. 1999). Thus, the petitioner must supply "proof of a logical sequence of cause and effect showing that the vaccination was the reason for the injury;" and the logical sequence must be supported by "reputable medical or scientific explanation, *i.e.*, evidence in the form of scientific studies or expert medical testimony." *Althen*, 418 F.3d at 1278; *Grant v. HHS*, 956 F.2d 1144, 1148 (Fed. Cir. 1992).

The *Althen* court also provided additional discussion of the "causation-in-fact" standard, as follows:

> Concisely stated, Althen's burden is to show by preponderant evidence that the vaccination brought about her injury by providing: (1) a medical theory causally connecting the vaccination and the injury; (2) a logical sequence of cause and effect showing that the vaccination was the reason for the injury; and (3) a

> showing of proximate temporal relationship between vaccination and injury. If Althen satisfies this burden, she is "entitled to recover unless the [government] shows, also by a preponderance of the evidence, that the injury was in fact caused by factors unrelated to the vaccine."

Althen, 418 F.3d at 1278 (citations omitted). The *Althen* court noted that a petitioner need not necessarily supply evidence from *medical literature* supporting petitioner's causation contention, so long as the petitioner supplies the *medical opinion* of an expert. (*Id*. at 1279-80.) The court also indicated that, in finding causation, a Program fact-finder may rely upon "circumstantial evidence," which the court found to be consistent with the "system created by Congress, in which close calls regarding causation are resolved in favor of injured claimants." (*Id*. at 1280.)

Since *Althen*, the Federal Circuit has addressed the causation-in-fact standard in several additional rulings, which have affirmed the applicability of the *Althen* test, and afforded further instruction for resolving causation-in-fact issues. In *Capizzano v. HHS*, 440 F.3d 1317, 1326 (Fed. Cir. 2006), the court cautioned Program fact-finders against narrowly construing the second element of the *Althen* test, confirming that circumstantial evidence and medical opinion, sometimes in the form of notations of treating physicians in the vaccinee's medical records, may in a particular case be sufficient to satisfy that second element of the *Althen* test. Both *Pafford v. HHS*, 451 F.3d 1352, 1355 (Fed. Cir. 2006), and *Walther v. HHS*, 485 F.3d 1146, 1150 (Fed. Cir. 2007), discussed the issue of which party bears the burden of ruling out potential non-vaccine causes. *DeBazan v. HHS*, 539 F.3d 1347 (Fed. Cir. 2008), concerned an issue of what evidence the special master may consider in deciding the initial question of whether the petitioner has met her causation burden. The issue of the temporal relationship between vaccination and the onset of an alleged injury was further discussed in *Locane v. HHS*, 685 F.3d 1375 (Fed. Cir. 2012), and *W.C. v. HHS*, 704 F.3d 1352 (Fed. Cir. 2013). *Moberly v. HHS*, 592 F.3d 1315 (Fed. Cir. 2010), concluded that the "preponderance of the evidence" standard that applies to Vaccine Act cases is the same as the standard used in traditional tort cases, so that *conclusive* proof involving medical literature or epidemiology is *not* needed, but demonstration of causation must be more than "plausible" or "possible." Both *Andreu v. HHS*, 569 F.3d 1367 (Fed. Cir. 2009), and *Porter v. HHS*, 663 F.3d 1242 (Fed. Cir. 2011), considered when a determination concerning an expert's credibility may reasonably affect the outcome of a causation inquiry. *Broekelschen v. HHS*, 618 F.3d 1339 (Fed. Cir. 2010), found that it was appropriate for a special master to determine the reliability of a diagnosis before analyzing the likelihood of vaccine causation. *Lombardi v. HHS*, 656 F.3d 1343 (Fed. Cir. 2011), and *Hibbard v. HHS*, 698 F.3d 1355 (Fed. Cir. 2012), both again explored the importance of assessing the accuracy of the diagnosis that supports a claimant's theory of causation. *Doe 11 v. HHS*, 601 F.3d 1349 (Fed. Cir. 2010) and *Deribeaux v. HHS*, 717 F.3d 1363 (Fed. Cir. 2013), both discuss the burden of proof necessary to establish that a "factor unrelated" to a vaccine may have caused the alleged injury.

Another important aspect of the causation-in-fact case law under the Program concerns the factors that a special master should consider in evaluating the reliability of expert testimony and other scientific evidence relating to causation issues. In *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), the Supreme Court listed certain factors that federal trial courts should utilize in evaluating proposed expert testimony concerning scientific issues. In *Terran v. HHS*, 195 F.3d 1302, 1316 (Fed. Cir. 1999), the Federal Circuit ruled that it is

appropriate for special masters to utilize *Daubert*'s factors as a framework for evaluating the reliability of causation-in-fact theories presented in Program cases.

I also note that while the Petitioner's *primary* contention throughout this case has been that the MMR vaccination of July 2012 *initially caused* the autism spectrum disorder of G.C.F., late in the case Petitioner's expert very briefly raised the alternative contention that G.C.F.'s vaccination *significantly aggravated* a preexisting ASD, causing it to worsen.

The elements of an off-Table *significant aggravation* case are set forth in *Loving v. HHS*, 86 Fed. Cl. 135, 144 (2009). There, the court combined the test from *Althen*, above, which defines off-Table causation cases, with the test from *Whitecotton v. HHS*, 81 F.3d 1099, 1107 (Fed. Cir. 1996), which concerns on-Table significant aggravation cases. The resultant test has six components, which are:

> (1) the person's condition prior to administration of the vaccine, (2) the person's current condition (or the condition following the vaccination if that is also pertinent), (3) whether the person's current condition constitutes a 'significant aggravation' of the person's condition prior to vaccination, (4) a medical theory causally connecting such a significantly worsened condition to the vaccination, (5) a logical sequence of cause and effect showing that the vaccination was the reason for the significant aggravation, and (6) a showing of a proximate temporal relationship between the vaccination and the significant aggravation.

Loving, 86 Fed. Cl. at 144; *see also W.C. v. HHS*, 704 F.3d 1352, 1357 (Fed. Cir. 2013) (holding that "the *Loving* case provides the correct framework for evaluating off-table significant aggravation claims").

II

BACKGROUND: THE OMNIBUS AUTISM PROCEEDING ("OAP")

This case is one of more than 5,400 cases filed under the Program in which petitioners alleged that conditions known as "autism" or "autism spectrum disorders" ("ASD")[3] were caused

[3] "Autism Spectrum Disorder" is a *general* classification which as of 2010 included five different specific disorders: Autistic Disorder, Childhood Disintegrative Disorder, Asperger's Syndrome, Rett Syndrome, and Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS). *King v. HHS*, No. 03-584V, 2009 WL 892296 at *5 (Fed. Cl. Spec. Mstr. Feb. 12, 2010). The term "autism" is often utilized to encompass *all* of the types of disorders falling within the autism spectrum. (*Id*.) I recognize that since the OAP test cases, the consensus description of ASDs, contained now in the "DSM-V" as opposed to the prior "DSM-IV," revises the prior subcategories of ASD set forth in the first sentence of this footnote. However, the DSM-V retains the same *general description* of ASDs. An ASD is a serious form of neurodevelopmental disorder defined by a collection of symptoms and behaviors, including significant impairment of social interaction and language skills, and the presence of repetitive,

by one or more vaccinations. A special proceeding known as the Omnibus Autism Proceeding ("OAP") was developed to manage these cases within the Office of Special Masters ("OSM"). A detailed history of the controversy regarding vaccines and autism, along with a history of the development of the OAP, was set forth in the six entitlement decisions issued as "test cases" for two theories of causation litigated in the OAP (see cases cited below), and will only be summarized here.

A group called the Petitioners' Steering Committee ("PSC") was formed in 2002 by the many attorneys who represented Vaccine Act petitioners who raised autism-related claims. About 180 attorneys participated in the PSC. Their responsibility was to develop any available evidence indicating that vaccines could contribute to causing autism, and eventually present that evidence in a series of "test cases," exploring the issue of whether vaccines could cause autism, and, if so, in what circumstances. Ultimately, the PSC selected groups of attorneys to present evidence in two different sets of "test cases" during many weeks of trial in 2007 and 2008. In the six test cases, the PSC presented two separate theories concerning the causation of ASDs. The first theory alleged that the *measles* portion of the measles, mumps, rubella ("MMR") vaccine could cause ASDs. That theory was presented in three separate Program test cases during several weeks of trial in 2007. The second theory alleged that the mercury contained in *thimerosal-containing vaccines* could directly affect an infant's brain, thereby substantially contributing to the causation of ASD. That theory was presented in three additional test cases during several weeks of trial in 2008.

Decisions in each of the three test cases pertaining to the PSC's *first* theory rejected the petitioners' causation theories. *Cedillo v. HHS*, No. 98-916V, 2009 WL 331968 (Fed. Cl. Spec. Mstr. Feb. 12, 2009) *aff'd*, 89 Fed. Cl. 158 (2009), *aff'd*, 617 F.3d 1328 (Fed. Cir. 2010); *Hazlehurst v. HHS*, No. 03-654V, 2009 WL 332306 (Fed. Cl. Spec. Mstr. Feb. 12, 2009), *aff'd* 88 Fed. Cl. 473 (2009), *aff'd*, 604 F.3d 1343 (Fed. Cir. 2010); *Snyder v. HHS*, No. 01-162V, 2009 WL 332044 (Fed. Cl. Spec. Mstr. Feb. 12, 2009), *aff'd*, 88 Fed. Cl. 706 (2009).[4] Decisions in each of the three "test cases" pertaining to the PSC's *second* theory also rejected the petitioners' causation theories, and the petitioners in each of those three cases chose not to appeal. *Dwyer v. HHS*, No. 03-1202V, 2010 WL 892250 (Fed. Cl. Spec. Mstr. Mar. 12, 2010); *King v. HHS*, No. 03-584V, 2010 WL 892296 (Fed. Cl. Spec. Mstr. Mar 12, 2010); *Mead v. HHS*, No. 03-215V, 2010 WL 892248 (Fed. Cl. Spec. Mstr. Mar. 12, 2010).

The "test case" decisions were comprehensive, analyzing in detail all of the evidence presented on both sides. The three test case decisions concerning the PSC's *first* theory (concerning the MMR vaccine) totaled more than 600 pages of detailed analysis, and were solidly affirmed in many more pages of analysis in three different rulings by three different judges of the United States Court of Federal Claims, and in two rulings by two separate panels of the United States Court of Appeals for the Federal Circuit. The three special master decisions

---

stereotyped interests. *E.g.*, *Snyder v. HHS*, No. 01-162V, 2009 WL 332044, at *31 (Fed. Cl. Spec. Mstr. Feb. 12, 2009).

[4] The petitioners in *Snyder* did not appeal the decision of the U.S. Court of Federal Claims.

concerning the PSC's *second* theory (concerning vaccinations containing the preservative "thimerosal") were similarly comprehensive.

All told, the 11 lengthy written rulings by the special masters, the judges of the U.S. Court of Federal Claims, and the panels of the U.S. Court of Appeals for the Federal Circuit *unanimously rejected* the petitioners' claims, finding no persuasive evidence that either the MMR vaccine or thimerosal-containing vaccines could contribute in any way to the causation of autism.

Thus, the proceedings in the six "test cases" concluded in 2010. Thereafter, the Petitioners in this case, and the petitioners in other cases within the OAP, were instructed to decide how to proceed with their own claims. The vast majority of those autism petitioners elected either to withdraw their claims or, more commonly, to request that the special master file a decision denying their claim on the written record, resulting in a decision rejecting the petitioner's claim for lack of support. However, a small minority of the autism petitioners have elected to continue to pursue their cases, seeking other causation theories and/or other expert witnesses. A few such cases have gone to trial before a special master, and in the cases of this type decided thus far, all have resulted in *rejection* of petitioners' claims that vaccines played a role in causing their child's autism. *See, e.g., Henderson v. HHS*, No. 09-616V, 2012 WL 5194060 (Fed. Cl. Spec. Mstr. Vowell Sept. 28, 2012) (autism not caused by pneumococcal vaccination); *Franklin v. HHS*, No. 99-855V, 2013 WL 3755954 (Fed. Cl. Spec. Mstr. Hastings May 16, 2013) (MMR and other vaccines found not to contribute to autism); *Coombs v. HHS*, No. 08-818V, 2014 WL 1677584 (Fed. Cl. Spec. Mstr. Hastings Apr. 8, 2014) (autism not caused by MMR or Varivax vaccines); *Blake v. HHS*, No. 03-31V, 2014 WL 2769979 (Fed. Cl. Spec. Mstr. Vowell May 21, 2014) (autism not caused by MMR vaccination); *Long v. HHS*, No. 08-792V, 2015 WL 1011740 (Fed. Cl. Spec. Mstr. Hastings Feb. 19, 2015) (autism not caused by influenza vaccine); *Brook v. HHS*, No. 04-405V, 2015 WL 3799646 (Fed. Cl. Spec. Mstr. Hastings May 14, 2015) (autism not caused by MMR or Varivax vaccines); *Holt v. HHS*, No. 05-136V, 2015 WL 4381588 (Fed. Cl. Spec. Mstr. Vowell June 24, 2015) (autism not caused by hepatitis B vaccine); *Lehner v. HHS*, No. 08-554V, 2015 WL 5443461 (Fed. Cl. Spec. Mstr. Vowell July 22, 2015) (autism not caused by influenza vaccine); *Miller v. HHS*, No. 02-235V, 2015 WL 5456093 (Fed. Cl. Spec. Mstr. Vowell August 18, 2015) (ASD not caused by combination of vaccines); *Allen v HHS*, No. 02-1237V, 2015 WL 6160215 (Fed. Cl. Spec. Mstr. Vowell Sept. 26, 2015) (autism not caused by MMR vaccination); *R.K. v. HHS*, No. 03-632V, 2015 WL 10936124 (Fed. Cl. Spec. Mstr. Vowell Sept. 28, 2015) (autism not caused by influenza vaccine), *aff'd*, 125 Fed. Cl. 57 (2016); *Hardy v. HHS*, No. 08-108V, 2015 WL 7732603 (Fed. Cl. Spec. Mstr. Hastings Nov. 3, 2015) (autism not caused by several vaccines); *Sturdivant v. HHS*, No. 07-788V, 2016 WL 552529 (Fed. Cl. Spec. Mstr. Hastings Jan. 21, 2016) (autism not caused by Hib and Prevnar vaccines); *R.V. v. HHS*, No. 08-504V (Fed. Cl. Spec. Mstr. Corcoran Feb. 19, 2016) (autism not caused by influenza vaccine) (on Court website), *aff'd*, 2016 WL 3647786 (Fed. Cl. June 2, 2016); *Murphy v. HHS*, No. 05-1063V, 2016 WL 3034047 (Fed. Cl. Spec. Mstr. Corcoran Apr. 25, 2016) (autism not caused by DTaP or MMR vaccines) (on review).

In addition, some autism causation claims have been rejected *without trial*, at times over the petitioner's objection, in light of the failure of the petitioner to file plausible proof of vaccine-causation. *See, e.g., Waddell v. HHS*, No. 10-316V, 2012 WL 4829291 (Fed. Cl. Spec. Mstr. Campbell-Smith Sept. 19, 2012) (autism not caused by MMR vaccination); *Fester v. HHS*,

No. 10-243V, 2016 WL 1745436 (Fed. Cl. Spec. Mstr. Dorsey April 7, 2016) (autism not caused by measles, mumps, rubella, and varicella (MMRV) vaccine); *Fresco v. HHS*, No. 06-469V, 2013 WL 364723 (Fed. Cl. Spec. Mstr. Vowell Jan. 7, 2013) (autism not caused by multiple vaccines); *Fesanco v. HHS*, No. 02-1770, 2010 WL 4955721 (Fed. Cl. Spec. Mstr. Hastings Nov. 9, 2010) (autism not caused by multiple vaccines); *Miller v. HHS*, No. 06-753V, 2012 WL 12507077 (Fed. Cl. Spec. Mstr. Hastings Sept. 25, 2012) (autism not caused by DTaP or MMR vaccines); *Pietrucha v. HHS*, No. 00-269V, 2014 WL 4538058 (Fed. Cl. Spec. Mstr. Hastings Aug. 22, 2014) (autism not caused by multiple vaccines); *Bushnell v. HHS*, No. 02-1648, 2015 WL 4099824 (Fed. Cl. Spec. Mstr. Hastings June 12, 2015) (autism not caused by multiple vaccines); *Bokmuller v. HHS*, No. 08-573, 2015 WL 4467162 (Fed. Cl. Spec. Mstr. Hastings June 26, 2015) (autism not caused by multiple vaccines); *Canuto v. HHS*, No. 04-1128, 2015 WL 9854939 (Fed. Cl. Spec. Mstr. Hastings Dec. 18, 2015) (autism not caused by DTP and DTaP vaccines); *Valle v. HHS*, No. 02-220V, 2016 WL 2604782 (Fed. Cl. Spec. Mstr. Hastings April 13, 2016) (autism not caused by DTaP vaccine). Judges of this court have affirmed the practice of dismissal without trial in such cases. *E.g.*, *Fesanco v. HHS*, 99 Fed. Cl. 28 (2011) (Judge Braden affirming); *Canuto v. HHS*, No. 04-1128V, 2016 WL 2586510 (Judge Yock affirming).

In none of the rulings since the test cases has a special master or judge found any merit in an allegation that any vaccine can contribute to causing autism.[5]

---

[5] I am well aware, of course, that during the years since the "test cases" were decided, in two cases involving vaccinees suffering from ASDs, Vaccine Act compensation was granted. But in *neither* of those cases did the Respondent concede, nor did a special master find, that there was any *"causation-in-fact"* connection between a vaccination and the vaccinee's ASD. Instead, in both cases it was conceded or found that the vaccinee displayed the symptoms of a *Table Injury* within the Table time frame after vaccination. (See Section I above).

In *Poling v.* HHS, the presiding special master clarified that the family was compensated because the Respondent conceded that the Poling child had suffered a *Table Injury--not* because the Respondent or the special master had concluded that any vaccination had contributed to causing or aggravating the child's ASD. *See Poling v.* HHS, No. 02-1466V, 2011 WL 678559, at *1 (Fed. Cir Spec. Mstr. Jan. 28, 2011) (a fees decision, but noting specifically that the case was compensated as a Table Injury).

Second, in *Wright v. HHS*, No. 12-423, 2015 WL 6665600 (Fed. Cl. Spec. Mstr. Sept. 21, 2015), Special Master Vowell concluded that a child, later diagnosed with ASD, suffered a "Table Injury" after a vaccination. However, she stressed that she was *not* finding that the vaccinee's ASD in that case was "caused-in-fact" by the vaccination--to the contrary, she specifically found that the evidence in that case did *not* support a "causation-in-fact" claim, going so far as to remark that the petitioners' "causation-in-fact" theory in that case was "absurd." *Wright v. HHS*, No. 12-423, 2015 WL 6665600, at *2 (Fed. Cl. Spec. Mstr. Sept. 21, 2015).

The compensation of these two cases, thus does *not* afford any support to the notion that vaccinations can contribute to the *causation* of autism. In setting up the Vaccine Act compensation system, Congress forthrightly acknowledged that the Table Injury presumptions

III

PROCEDURAL HISTORY

Petitioner filed a Petition for Vaccine Compensation on behalf of her son G.C.F. on July 17, 2013, alleging that G.C.F. suffered a "brain injury" resulting from adverse reactions to one or more of many vaccinations administered between March 28, 2011, and July 2, 2012. (Petition ("Pet."), ECF No. 1.) The case was initially assigned to Special Master Millman. (ECF No. 2.)

On September 24, 2013, Petitioner filed G.C.F.'s medical records marked as Exhibits 1-13. (ECF Nos. 7-8.) Following an initial status conference, the case was reassigned to me on September 25, 2013. (ECF No. 9.) Respondent filed her "Rule 4 report" on December 6, 2013. (ECF No. 13). Respondent argued that Petitioner failed to identify an injury or establish a sufficient causal medical theory. (ECF No. 13, p. 10.) Respondent further stressed the view that G.C.F.'s condition is explained by his autism diagnosis, with onset occurring within the first year of life and with no evidence in the record suggesting causation or aggravation by G.C.F's vaccinations. (*Id.*)

On July 15, 2014, Petitioner filed an expert medical report by Yuval Shafrir, M.D., accompanied by Dr. Shafrir's *curriculum vitae*, marked as Exhibits 14 and 15 respectively. (ECF Nos. 21-2, 21-3.) In that report, Dr. Shafrir specified that MMR and Varivax (varicella) vaccinations administered to G.C.F. on July 2, 2012, caused his developmental disorder. (Ex. 14, pp. 5-6 and 25 of 27.) Between July 15 and July 24, 2015, Petitioner additionally filed Exhibits 16-42, comprising medical literature referenced by Dr. Shafrir. (ECF Nos. 22, 24-26.)

On December 10, 2014, Respondent filed an amended "Rule 4 report." (ECF No. 32.) Respondent also filed an expert report by Max Wiznitzer, M.D., marked as Exhibit A, and a *curriculum vitae* marked as Exhibit B. (ECF No. 31.)

On February 4, 2015, Petitioner filed additional medical literature marked as Exhibits 43-46. (ECF No. 35.)

Petitioner filed a supplemental expert report by Dr. Shafrir on August 19, 2015, marked as Exhibit 48.[6] (ECF No. 40.) Accompanying literature marked as Exhibits 49-68 was filed

---

would result in compensation for some injuries that were *not*, in fact, truly vaccine-caused. H.R. Rept. No. 99-908, 18, 1986 U.S.C.C.A.N. 6344, 6359. ("The Committee recognizes that there is public debate over the incidence of illnesses that coincidentally occur within a short time of vaccination. The Committee further recognizes that the deeming of a vaccine-relatedness adopted here may provide compensation to some children whose illness is not, in fact, vaccine-related.")

[6] Initially, Petitioner filed Dr. Shafrir's supplemental report on August 18, 2015, as Exhibit 47. (ECF No. 39.) However, during the subsequent hearing in this case, Dr. Shafrir explained that the report marked as Exhibit 47 omitted a reference and that Exhibit 48 is a corrected version of that report. (Tr. 26.) Thus, this Decision will only address Dr. Shafrir's second supplemental report marked as Exhibit 48, and the report marked as Exhibit 47 will not be further discussed.

between August 27 and August 31, 2015. (ECF Nos. 43-46.) Updated medical records were also filed in August and September of 2015. (ECF Nos. 46, 50-51.)

On September 4, 2015, Respondent filed as Exhibit C a supplemental expert report by Dr. Wiznitzer responsive to Dr. Shafrir's second report, along with literature marked Exhibits D-F. (ECF No. 47.)

On September 4, 2015, the parties also simultaneously filed Pre-Hearing Submissions. (ECF Nos. 48-49.)

An evidentiary hearing was held at the National Courts Building in Washington, D.C., on September 18, 2015. (Transcript of Proceedings ("Tr."), ECF No. 54.) Testimony by Ms. Cunningham, as well as by Drs. Shafrir and Wiznitzer, was heard. (*Id*.)

Petitioner filed a Post-Hearing Brief on December 17, 2015, and Respondent filed a responsive Post-Hearing Brief on February 4, 2016. (ECF Nos. 57-58.) Petitioner filed a reply brief on March 7, 2016. (ECF No. 59.)

IV

FACTS

G.C.F. was born on March 26, 2011. (Ex. 10-1, p. 150.) He had a heart murmur. (Ex. 9, p. 14.) No medical intervention was planned, and a three-month follow-up echocardiogram was scheduled. (Ex. 9, p. 32.) He received his first hepatitis B vaccination on March 28, 2011. (Ex. 3, p. 5.)

No concerns were reported at G.C.F.'s well visits on April 11, and May 9, 2011. (Ex. 11, pp. 102-04 of 104.) He was seen for another well-child exam on June 17, 2011, at which he received several vaccinations. (*Id*., pp. 100-01.) Again, no significant concerns were reported. (*Id*.)

There is no record that he was seen again by his pediatrician until January 6, 2012, at nine months of age. (Ex. 11, pp. 99-100.) At that time, his development was assessed, and no problems were reported. (*Id*.) During the appointment, G.C.F. again received several vaccinations. (*Id*.)

G.C.F. returned to his pediatrician on March 28, 2012, at twelve months of age. (Ex. 11, pp. 97-99 of 104.) His parents reported that he "rocks self to sleep on knees and elbows" and "bangs his head on side of crib." (*Id*., p. 98.) Developmental notes for that visit note nothing else unusual. (*Id*.) Additional vaccinations were administered. (*Id*., pp. 98-99.)

On April 3, 2012, G.C.F. was seen again, and his father reported concern regarding some of his child's behavior, and that he was "concerned about autism." (Ex. 11, p. 97.) Specifically, he reported that when G.C.F. was in his crib, he repeatedly bounced his head off the wall, and that when the parents stopped the behavior the child screamed, cried, and threw a tantrum. (*Id*.) G.C.F.'s father showed the physician a video of G.C.F. rocking and banging his head. (*Id*.) The parents also reported that the child did not seem to hurt himself when banging his head, that his

sleep patterns were irregular, and that he did not sleep through the night. (*Id*.) The doctor's notes indicate that G.C.F.'s general behavior was "developmentally appropriate." (*Id*.) The notes also state that other than "[r]ecurrent head banging," there were "[n]o *other* autistic symptoms." (*Id*., emphasis added.) A developmental pediatric evaluation and a pediatric neurology consultation were recommended. (*Id*.)

On Monday, July 2, 2012, G.C.F. returned to his physician for a fifteen-month well-child evaluation. (Ex. 11, pp. 96-97.) He was "still banging his head" on hard surfaces, and "holds his head in the middle of activities and starts crying." (*Id*.) G.C.F.'s developmental progress was also noted. (*Id*.) G.C.F. was given his first MMR (measles, mumps, and rubella) and varicella vaccinations. (*Id*.)

G.C.F. returned to the pediatrician four days later, on Friday, July 6, with a history of fever and continuous crying for two days. (Ex. 11, p. 95.) The next day, on July 7, 2012, G.C.F. was admitted to St. Barnabas Medical Center with a runny nose, cough, congestion, and fever. (Ex. 2, p. 1 of 19.) G.C.F. arrived in "severe respiratory distress," with a temperature of 99.9 degrees. (Ex. 2, p. 2.) His mother reported that he had developed a fever three days prior ("Wednesday") that had subsided with ibuprofen. (Ex. 2, p. 4.) Upon examination, G.C.F. was alert. (Ex. 2, p. 5.) He was administered corticosteroids and epinephrine, and was discharged the next day on July 8, 2012, with a final diagnosis of "croup," a type of viral infection. (Ex. 2, p. 1; Tr. 137-38.)

G.C.F. next saw his pediatrician on July 24, 2012. (Ex. 11, p. 94.) G.C.F. had broken out in a rash "all over [his] body" that had appeared the day before. (*Id*.) His parents reported that he had "not been doing too well since administration of MMR and varicella about 3 weeks ago." (*Id*.) G.C.F.'s repeated head-banging was again reported, as was an upcoming evaluation at Children's Specialized Hospital ("CSH"). (*Id*.) The pediatrician felt that the rash was "probably related to a varicella vaccine adverse event." (*Id*., p. 95.)

On October 3, 2012, at eighteen months of age, G.C.F. was seen at CSH by Mary Van Horn, a nurse practitioner, for an initial neurodevelopmental evaluation. (Ex. 5, pp. 40-44 of 48.) The notes indicate that G.C.F.'s parents expressed concern about "developmental delays and the possibility of an autism diagnosis," and that "they began having concerns [when G.C.F. was] 11 months old." (*Id*., p. 40.) G.C.F.'s parents reported a number of specific concerns, including head-banging, severe tantrums, that their son inconsistently responded to his name, lack of pointing, lack of gestures, using "Mama" and "Dada" only non-specifically, poor eye contact, lack of single words up to 16 months, and repetitive use of toys.[7] (*Id*., pp. 40-41.) G.C.F.'s parents were also noted as having reported a "regression" in language and social skills (*id*., p. 41), while nurse Van Horn assessed that he was "speech-delayed" (*id*., p. 43). Ms. Van Horn concluded that G.C.F. was "a child who should be considered at risk for autism." (*Id*., p. 43.) A follow-up was recommended with Dr. Malia Beckwith, a developmental pediatrician. (*Id.*)

[7] Petitioner's expert contended that nurse Van Horn's report contained "a lot of errors." (Ex. 14, p. 10.) Significantly, however, the only error Dr. Shafrir specifically noted was that nurse Van Horn incorrectly recorded that G.C.F.'s mother had taken Aldactone for hypertension during pregnancy instead of Aldomet. (*Id*.)

On October 20, 2012, G.C.F. received an initial evaluation by the New Jersey Early Intervention System. (Ex. 1, p. 35.) G.C.F. scored significantly below the mean in the "Personal/Social," "Adaptive," "Communication," and "Cognitive" testing categories. (Ex. 1, p. 38.)

On October 23, 2012, G.C.F. was evaluated for speech therapy at Children's Specialized Hospital, by speech/language pathologists Kristen Martinez and Laura Watson. (Ex. 1, pp. 2-10 of 85.) He was seen for concerns related to expressive and receptive language delays. (*Id.*, p. 2.) The "age of onset" is listed as "7-12 months." (*Id.*) It was noted that G.C.F. had no history of developmental regression. (*Id.*, p. 3.) Testing of G.C.F.'s expressive and receptive language skills showed that he was below the limits expected for his age in both categories, thereby confirming a diagnosis of expressive/receptive language disorder. (*Id.*, pp. 5-6, 8.)

On January 22, 2013, at twenty-one months of age, G.C.F. was seen by Dr. Beckwith, a developmental pediatrician. (Ex. 5, pp. 18-24 of 48.) Dr. Beckwith reviewed G.C.F.'s earlier visit with nurse Van Horn. (*Id.*, p. 18.) G.C.F.'s mother reported to Dr. Beckwith that her son's behaviors "continued to be very challenging," that he had inconsistent eye contact, did "not often respond to his name," had "limited" communication abilities, and engaged in "repetitive behavior." (*Id.*) Based on G.C.F.'s history and his clinical evaluation, Dr. Beckwith noted that G.C.F. met the criteria for an "autistic disorder." (*Id.*, p. 22.)

G.C.F. had another appointment with Dr. Beckwith on April 16, 2013. (Ex. 5, pp. 10-14 of 48.) G.C.F.'s mother described G.C.F.'s behaviors since the previous visit to Dr. Beckwith. (*Id.*, p. 10.) A neurologic review stated that "no regression or loss of skills has been noted." (*Id.*, p. 11.) Dr. Beckwith's diagnostic impression continued to be "autistic disorder," along with mixed expressive receptive language disorder, sensory integration concerns, and significant feeding rigidity. (*Id.*, pp. 12-13.)

Since then, G.C.F., tragically, has continued to suffer from a severe neurodevelopmental disorder, characterized as an autism spectrum disorder. (*E.g.*, Ex. 5, pp. 4-7; Tr. 17-22.)

V

SUMMARY OF THE EXPERT WITNESSES' QUALIFICATIONS AND OPINIONS

In this case, Petitioner and Respondent each presented an expert report and testimony from a medical expert. At this point, I will briefly summarize both the qualifications and the opinions of these expert witnesses.

A. Petitioner's expert, Dr. Yuval Shafrir

1. Qualifications

Yuval Shafrir, M.D., attended the Sackler School of Medicine in Tel Aviv, Israel, graduating *magna cum laude* in 1982. (Ex. 15, p. 1.) After graduation, he spent more than two years in pediatric residencies before moving to the United States, where he continued as a pediatric resident at the North Shore University Hospital in New York from February 1986 to

June 1988. (*Id*.) Dr. Shafrir then completed a pediatric neurology fellowship at Washington University in St. Louis from 1988 to 1991. (*Id.*) He continued the following year to complete a fellowship in pediatric neurophysiology and epileptology at Miami Children's Hospital. (*Id*.)

Dr. Shafrir was certified by the American Board of Pediatrics. (Ex. 15, p. 2.) He also received certification from the American Board of Psychiatry and Neurology, with a special qualification in Child Neurology. (*Id*.) In 1998, he was certified by The American Board of Clinical Neurophysiology. (*Id*.) He maintains a license to practice medicine in Maryland. (*Id*.)

Currently, Dr. Shafrir works in private practice as a pediatric neurologist in Baltimore, MD. (Ex. 15, p. 3.) He has held several teaching positions since 1988, including assistant professor in neurology and pediatrics at the United Services University of the Health Sciences, F. Edward Herbert School of Medicine, a position which he has held for over 20 years. (Ex. 15, p. 3.) Since 2004 he has also been an assistant professor in the Department of Pediatrics at the University of Maryland School of Medicine, in Baltimore, Maryland. (*Id*.)

Dr. Shafrir has published twelve medical journal articles and ten abstracts. (Ex. 15, pp. 3-6.) He has also presented numerous lectures in pediatric neurology, primarily on the subject of seizures. (Ex. 15, pp. 6-8.) Dr. Shafrir is not a member of any professional associations. (Tr. 75.)

2. Summary of Dr. Shafrir's opinion

According to Dr. Shafrir, G.C.F. had not displayed any symptoms of autism prior to July 2, 2012. (Ex. 14, p. 18 of 27; Tr. 33-34, 38.) Then, he contends, G.C.F. experienced a dramatic developmental regression between July 2 and his evaluation on October 3, 2012. (Tr. 76-77.) Significantly, this opinion is based, in part, on Dr. Shafrir's rejection of G.C.F.'s head-banging behavior in early 2012 as a symptom of autism. (Ex. 14, p. 18.)

Based on his understanding of G.C.F.'s medical history, Dr. Shafrir theorized that G.C.F. suffered an "encephalopathy" (brain injury), which caused his autistic symptoms. (Ex. 14, p. 25.) Dr. Shafrir argued that this encephalopathy was likely caused by an *autoimmune* reaction to the MMR vaccination that G.C.F. received on July 2, 2012.[8] (*Id*.) (An autoimmune reaction means that the MMR caused G.C.F.'s immune system to attack his own brain; the immune system components ("antibodies") that carry out an autoimmune reaction are described as "autoantibodies.")

In support of his theory that G.C.F.'s condition is autoimmune, Dr. Shafrir pointed to an extensive rash that G.C.F. experienced about three weeks following his MMR and varicella immunizations on July 2.[9] (Tr. 78-79.) Although Dr. Shafrir conceded that the rash itself is not

---

[8] In his expert report, Dr. Shafrir opined that the autoimmune reaction was to the "combined MMR and varicella" vaccinations. (Ex. 14, p. 25.) During the hearing, however, Dr. Shafrir stated instead that his theory is actually specific to the *MMR* vaccination. (Tr. 80.) He admitted that his earlier inclusion of the varicella vaccine as causal was an "error." (*Id*.)

[9] Though Dr. Shafrir is clearly of the opinion that G.C.F.'s rash was vaccine-caused, he was inconsistent in his opinion regarding the precise cause of the rash. In his initial report, he

evidence of autoimmunity, he opined that the severity of the rash provided evidence that G.C.F. had an abnormal immune system and was susceptible to autoimmunity. (*Id*.)

While Dr. Shafrir admitted that the "exact mechanism [of causation] is very frequently impossible to prove," his expert report cited theories such as, "molecular mimicry," "bystander activation," "epitope spreading," and "polyclonal activation," as possible mechanisms of how a vaccination might trigger an autoimmune disease. (Ex. 14, p. 21.) During the hearing, however, Dr. Shafrir discounted the possibility of "polyclonal activation" (Tr. 40), and never explained the "epitope spreading" and "bystander activation" mechanisms. He stated that the "probable" mechanism was molecular mimicry. (Tr. 40.)

Dr. Shafrir cited a number of medical articles which, he said, offered support to his theory that autoimmunity could play a role in autism, and/or that the MMR vaccine can cause an autoimmune reaction. (Ex. 14, pp. 22-24.) Dr. Shafrir further contended that his theory of causation of autism is supported by his idea that autism is an "epidemic," and therefore its prevalence cannot be explained solely by genetics. (Tr. 29-33.)

In his supplemental report, Dr. Shafrir sought to further bolster his opinion by analogizing to research indicating that a disorder known as "narcolepsy" can be caused by a type of influenza vaccine. (Ex. 48.)

B. Respondent's expert, Dr. Max Wiznitzer

1. Qualifications

Max Wiznitzer, M.D., received his B.S. degree in medical education in 1975, and a medical degree in 1977, both from Northwestern University. (Ex. B, p. 1.) He completed a residency in pediatrics in 1980, at the Children's Hospital Medical Center in Cincinnati, Ohio. (Ex. B, p. 1.) He then completed a one-year fellowship at the Cincinnati Center for Developmental Disorders, a three-year fellowship in pediatric neurology at the Children's Hospital of Philadelphia, and a two-year fellowship at the Albert Einstein College of Medicine in New York, studying higher cortical functions. (Ex. B, pp. 1-2.)

Dr. Wiznitzer has received appointments to practice at several hospitals, including: the Department of Neurology of Montefiore Medical Center in New York; the Department of

---

did not specify which of G.C.F.'s vaccinations he felt caused the rash, but indicated that the pediatrician felt it was the varicella. (Ex. 14, p. 19.) In his supplemental report, he clearly attributed the rash to the MMR vaccination, stating that "[t]he MMR immunization produced fever and rash indicating more significant system infection by the vaccine viruses, most likely the measles." (Ex. 48, p. 1.) During the hearing, he confirmed that his opinion was that the rash was caused by the MMR vaccine, but then immediately, and inexplicably, seemed to endorse the pediatrician's diagnosis of a varicella-caused rash. (Tr. 79.)

For his part, Dr. Wiznitzer opined that the rash was unlikely to be caused by the MMR vaccine, because it was pruritic (itchy), which is more consistent with a varicella rash. (Tr. 98-100.)

Neurology at Bronx Municipal Hospital Center; and the Rainbow Babies and Children's Hospital in Cleveland. (Ex. B, p. 2.) He has served as a consultant in pediatrics and neurology at several other hospitals as well. Dr. Wiznitzer has also maintained a continuous practice as an associate pediatrician and associate neurologist at University Hospitals of Cleveland since 1986. (Ex. B, p. 2.)

At Rainbow Babies and Children's Hospital in Cleveland, Dr. Wiznitzer served as Co-Director of the Rainbow Autism Center in 1991; as Chief of the Division of Pediatric Neurology from 1992 to 1995; and as the Director of the Rainbow Autism Center from 1992 through 2010. (Ex. B, p. 3.) He has taught pediatrics and neurology since 1986 at the Case Western Reserve University School of Medicine, and in 2013 he became Professor of Pediatrics at the school. (Ex. B, p. 2.) Although he no longer directs the autism center, he estimates that in his current practice at least 25% of his patients have been diagnosed with autism. (Tr. 85.)

Dr. Wiznitzer is certified by the American Board of Pediatrics. (Ex. B, p. 5.) He also received certification from the American Board of Psychiatry and Neurology, with a special qualification in Child Neurology. (*Id*.) In 2004, the American Board of Psychiatry and Neurology certified his competence in Neurodevelopmental Disabilities. (*Id*.) He maintains licenses to practice medicine in Ohio, Pennsylvania, and New York. (*Id*.)

Dr. Wiznitzer has been a reviewer of articles for many medical journals, most notably for *Pediatric Neurology*, *Lancet Neurology*, and the *Journal of Child Neurology*, and has also served on the editorial boards of those three journals. (Ex. B, p. 6.) He currently serves on a multitude of medical advisory groups at the local, state, and national levels. (*Id*., pp. 6-9.) Dr. Wiznitzer has published sixty-seven medical articles, eleven book chapters, and fifty-five abstracts. (*Id*., pp. 13-23.) He has also presented numerous lectures at the invitation of community organizations concerning childhood developmental disorders, primarily on the subject of autism. (*Id*., pp. 24-54.) He has been extensively engaged in autism-related research since 1986. (Tr. 83-86.) He has participated in developing diagnostic tests for autism. (Tr. 86.) He currently is part of a committee of the American Academy of Neurology developing guidelines for autism management. (*Id*.)

2. Summary of Dr. Wiznitzer's opinion

Dr. Wiznitzer strongly disagreed with Dr. Shafrir's causation theory. In Dr. Wiznitzer's view, G.C.F. is properly diagnosed as a young boy with an autism spectrum disorder (Ex. A, p. 7), who showed significant signs of that ASD *prior* to his vaccinations of July 2, 2012. (*Id*.) Dr. Wiznitzer also stated that the "[e]volution of [G.C.F.'s] ASD fits *** identified development trajectories" of autism. (*Id*.) Furthermore, he disagreed with Dr. Shafrir that G.C.F.'s medical record is either "suggestive of or consistent with [G.C.F. having] an underlying immune disorder." (*Id*.)

Dr. Wiznitzer's expert report and hearing testimony noted a number of specific citations from Dr. Shafrir's references which he believes are contrary to Dr. Shafrir's hypothesis. (Ex. A, pp. 7-9; Tr. 103-24.) Contrary to Dr. Shafrir, Dr. Wiznitzer does not believe that the role of immune dysfunction and autoimmunity in autism is well supported, nor does he believe that such a theory is supported by Dr. Shafrir's references. (Ex. A, p. 8.) Furthermore, Dr. Wiznitzer noted that the studies which Dr. Shafrir referenced for the proposition that autoimmune

encephalitis has been described as a cause of autism, included participants whose "clinical presentation" is "not applicable in the case of [G.C.F.]," and that G.C.F.'s clinical history is not consistent with an autoimmune encephalitis. (*Id.*, pp. 8-9.)

VI

SUMMARY OF MY OPINION

After careful consideration of the entire record of this case, I find that Petitioner and Dr. Shafrir have failed to demonstrate that it is "more probable than not" [10] that G.C.F.'s MMR vaccination of July 2, 2012, had any role in initially causing, or in aggravating, G.C.F.'s autism spectrum disorder, or his autistic symptoms. First, Dr. Shafrir based his opinion on an incorrect assumption concerning the *onset* of G.C.F.'s autistic symptoms. (See Section VII of this Decision, below.) Second, Respondent's expert Dr. Wiznitzer is far more *qualified* to opine concerning the causation of autism, and was a much more *persuasive* witness in this case. (Section VIII.) Third, after a review of all the evidence, including medical articles, I find that Dr. Shafrir failed to demonstrate *in general* that the MMR vaccination *can* result in autoimmunity causing autism or autistic symptoms. (Section IX.) Fourth, even if it were assumed that the MMR vaccine is *capable* of causing autism or autistic symptoms via autoimmunity, there is no evidence of autoimmunity or abnormal immune system activity in *G.C.F.*'s own case. (Section X.) Next, Petitioner and Dr. Shafrir did not demonstrate any validity to their alternative "significant aggravation" argument in this case. (Section XI.)

And finally, in Section XII below, I will summarize why the Petitioner's case fails the *Althen* criteria for showing that a vaccine "initially caused" an injury, as well as the *Althen/Loving* criteria for showing that a vaccine "significantly aggravated" an injury.

VII

DR. SHAFRIR'S OPINION IS BASED ON THE INCORRECT ASSUMPTION THAT THE ONSET OF G.C.F.'S ASD SYMPTOMS OCCURRED *AFTER* THE VACCINATION IN QUESTION

One basic deficiency in Dr. Shafrir's causation opinion in this case is that he based his opinion on a false assumption regarding the *onset* of G.C.F.'s autism. Specifically, Dr. Shafrir opined that G.C.F. experienced the *first symptoms* of his ASD between July and October of 2012, following his MMR vaccination on July 2, 2012. (Tr. 36; Ex. 14, p. 18.) Dr. Wiznitzer, however, contended that a careful review of the record indicates that G.C.F. had exhibited symptoms of his ASD well *prior* to July of 2012, including his head-banging in March of 2012.

---

[10] Petitioner has the burden of demonstrating the facts necessary for entitlement to an award by a "preponderance of the evidence." § 300aa-12(a)(1)(A). Under that standard, the existence of a fact must be shown to be "more probable than its nonexistence." *In re Winship*, 397 U.S. 358, 371 (1970) (Harlan, J., concurring).

(Tr. 87, 93-96; Ex. A, p. 7.) Dr. Wiznitzer opined that G.C.F. followed one of the typical patterns of ASD onset. (Ex. A, p. 7; Tr. 100-02.) For the reasons described below, I find Dr. Wiznitzer's interpretation of the record concerning this issue to be more persuasive.

A. Contrary to Dr. Shafrir's contention, G.C.F.'s head-banging was a symptom of his ASD.

Dr. Shafrir did not dispute the fact, well documented in the medical records, that in March of 2012 G.C.F. began intentionally and repeatedly banging his head on hard surfaces. Dr. Shafrir, however, contended that G.C.F.'s head-banging was *not* a sign of autism. (Ex. 14, p. 18; Tr. 36-37, 76.) In that regard, Dr. Shafrir suggested that G.C.F.'s pediatrician did not view the head-banging as diagnostic of ASD. (Tr. 36-37.) Dr. Shafrir further cited a study which concluded that children who display head-banging at about age 1 typically have "no serious behavioral sequelae."[11] (Tr. 36-37; Ex. 16, p. 647.) Dr. Shafrir further stated, based on his own clinical practice, that the head-banging behavior in some children is likely in reaction to a headache or infantile migraine. (Ex. 14, p. 6.)

Dr. Shafrir's opinion regarding the head-banging is flawed. First, his insistence that G.C.F.'s pediatrician rejected the idea of his head-banging as a symptom of ASD is incorrect. It is true that the pediatrician, Dr. Dosunmu, noted at G.C.F.'s visit on April 3, 2012, that G.C.F. was "developmentally appropriate" and demonstrated "social skills appropriate for age." (Ex. 11, p. 97 of 104.) However, at the same time, she also referred G.C.F. for evaluation by a pediatric neurologist and a developmental pediatrician, *specifically for the recurrent head-banging*, noting that G.C.F. had "no *other* autistic symptoms" (emphasis added). (*Id*.) Thus, in sending G.C.F. to a specialist, and saying that he had no "other" symptoms of autism, G.C.F.'s pediatrician was clearly indicating a concern that the head-banging *might* be a symptom of autism.

To be sure, Dr. Wiznitzer did not claim that based on the head-banging symptom *alone*, G.C.F. could have been diagnosed for certain with autism in March or April of 2012. Dr. Wiznitzer did *not* dispute the article submitted by Dr. Shafrir (Ex. 16) indicating that many children go through a head-banging stage with no permanent consequences. But he explained that in *retrospect*, knowing as we do that G.C.F. in fact began exhibiting other clear-cut symptoms of autism later in 2012, he can state that the head-banging was an early symptom of autism in G.C.F. (Tr. 96; *see also* Tr. 87, 94, 102.) In this regard, Dr. Wiznitzer pointed out that another scientific article, published in 2007, states that head-banging *can* be one of the stereotyped, repetitive behaviors that form a key part of autism. (*See* Ex. D, Johnson, *et al.*, Identification and Evaluation of Children with Autism Spectrum Disorders, 120 *Pediatrics* 1183, at 1193-94.) Indeed, Dr. Shafrir himself characterized head-banging as "not infrequent" among the ASD population.[12] (Ex. 14, p. 18.) In addition, as Dr. Wiznitzer pointed out (Tr. 96), when

---

[11] *See* Ex. 16, K. Abe, *et al.*, *Natural History and Predictive Significance of Head-Banging, Head-Rolling and Breath-Holding Spells*, 26 Dev. Med. & Child Neurology 644 (1984).

[12] The Abe study cited by Dr. Shafrir was attempting to assess the "predictive value" of head-banging. (Ex. 16, p. 1183.) Thus, even accepting that study at face value, the study would not support the contention that head-banging is *not* a symptom associated with ASD, only that it is not *predictive* of ASD. Moreover, even if the Abe and Johnson studies were in conflict, I would still give greater weight to the Johnson study. I note that whereas the Johnson study was

the developmental pediatrician Dr. Beckwith definitely diagnosed G.C.F. with an autism disorder on January 22, 2013, she specifically noted "repetitive motor mannerisms of head-banging" as one of his *symptoms of autism*. (Ex. 5, p. 23 of 48.) Similarly, nurse Van Horn on Oct. 3, 2012, listed head-banging as one of the symptoms supporting her conclusion that G.C.F. was "at risk" for autism. (Ex. 5, p. 43 of 48.)

Dr. Wiznitzer also pointed out (Tr. 96) that G.C.F.'s head-banging in March of 2012 was "more than simple head-banging," because when his parents tried to stop the behavior, he would scream, cry, and throw a tantrum (Ex. 11, p. 97 of 104), thus further indicating that G.C.F.'s head-banging in early 2012 was an early symptom of his autism.

B. Other evidence of symptoms of autism in G.C.F. predating the July 2012 vaccinations

Dr. Wiznitzer also pointed out (Tr. 95) that in April of 2012 his pediatrician noted that G.C.F. suffered from a sleep disturbance, including a failure to sleep through the night (Ex. 11, p. 97 of 104). Dr. Wiznitzer explained that 20 to 25 percent of autistic children under age 4 will have a similar sleep disturbance. (Tr. 95.) Thus, I credit Dr. Wiznitzer's view that, again with the benefit of hindsight, the *sleep disturbance* in early 2012 was likely another early symptom of autism.

Further, on October 3, 2012, when G.C.F.'s parents expressed concerns about his "developmental delays and the possibility of an autism diagnosis," they specifically stated that "they began having concerns [when G.C.F. was] 11 months old." (Ex. 5, p. 40 of 48.) Similarly, on October 23, 2012, G.C.F's parents reported that the "age of onset" of his language delays was "7-12 months." (Ex. 1, p. 2 of 85.) G.C.F. was 11 months old several months before the MMR vaccination that Dr. Shafrir implicates, which was administered on July 2, 2012, at around age 15 months. Thus, these two reports are further significant indications that G.C.F. was exhibiting early symptoms of his ASD in the spring of 2012, well before the vaccination in question. And similarly, Dr. Wiznitzer opined that, based on his review of G.C.F.'s medical records, he perceived a "stagnation" or "difference" in G.C.F.'s language development, in the period when G.C.F. was between "seven and 12 months of age." (Tr. 93.)

C. Dr. Shafrir was mistaken in asserting that G.C.F.'s pediatrician in April 2012 wrote that G.C.F. did not have autism at that time.

Dr. Shafrir asserted on several occasions that G.C.F.'s pediatrician wrote in the child's records in the spring of 2012 that G.C.F. specifically did *not* have symptoms of autism at that time. (*E.g.*, Tr. 33-34, 36, 160; Ex. 14, p. 18 of 27.) Dr. Shafrir, however, was, deliberately or not, misconstruing the pediatric records. To be sure, as noted above, on April 3, 2012, the

---

published in 2007, the Abe study was published in 1984 and was based on questionnaires completed between 1975 and 1982. (Ex. 16, p. 1184.) As Dr. Wiznitzer explained, diagnostic criteria for ASD have changed over the years and were much more rigid 30 years ago. (Tr. 139-40.) Moreover, he noted that the public was less aware of the condition. (*Id*.) In that regard, I note that the Abe study offers no indication that children were specifically screened for ASD. (Ex. 16.) In contrast, the much more recent Johnson article was specifically intended to address the identification of children with ASD. (Ex. D.)

pediatrician found G.C.F. to be "developmentally appropriate," with "social skills appropriate." (Ex. 11, p. 97 of 104.) However, at the *same time*, based *specifically upon the head-banging symptom*, she referred G.C.F. for evaluations by a pediatric neurologist and a developmental pediatrician, and noted only that G.C.F. at the time had "no *other* autistic symptoms" in addition to the head-banging. (*Id.*) The pediatrician's full notation, therefore, clearly indicates that she was concerned that the head-banging *might* be a symptom of autism, and wanted that possibility evaluated by a specialist. Dr. Shafrir, therefore, was clearly wrong in asserting that the pediatrician's notations concerning "appropriate" development on April 3, 2012, was a flat statement that G.C.F. was definitely *not* displaying any symptoms of autism at that time.

D. Dr. Shafrir's incorrect assumption regarding the onset of G.C.F.'s ASD is fatal to his causation opinion.

I find as a matter of fact, based on the evidence cited in Sections VII(A), (B), and (C) immediately above, that the first symptoms of G.C.F.'s autism occurred *several months prior* to his MMR vaccination of July 2, 2012. But throughout his expert reports and his hearing testimony, Dr. Shafrir consistently based his causation opinion in this case on the assumption that the onset of G.C.F's autistic symptoms took place *after* his MMR vaccination on July 2, 2012, between July 2 and his visit to the nurse practitioner on October 3, 2012.[13]

Thus, Dr. Shafrir's causation opinion is simply at odds with the record of this case, which shows that G.C.F.'s autism *pre-dated* the July 2012 vaccination implicated by Dr. Shafrir's theory. Therefore, as a threshold matter, even before considering the details of Dr. Shafrir's theory, I find his opinion utterly unpersuasive, because it is based upon a key misassumption of fact. *Dobrydnev v. HHS*, 566 Fed. Appx. 976, 982-83 (Fed. Cir. 2014) (holding that the special master was correct in noting that "when an expert assumes facts that are not supported by preponderance of the evidence, a finder of fact may properly reject the expert's opinion")(citing *Brooke Group Ltd. v. Brown & Williamson Tobacco Corp*., 509 U.S. 209, 242 (1993)).

VIII

DR. WIZNITZER WAS A MUCH MORE QUALIFIED AND PERSUASIVE WITNESS THAN DR. SHAFRIR IN THIS CASE

Given that Dr. Shafrir's causation theory in this case was based upon an incorrect assumption concerning the onset of G.C.F.'s symptoms of autism, I could end my discussion of this case with Section VII. However, in the interest of completeness, I will also point out, in Sections VIII, IX, X, and XI of this Decision, the other ways in which Dr. Shafrir's theory was flawed, and in which Dr. Wiznitzer's testimony was more persuasive.

---

[13] In one answer to a leading question by Petitioner's counsel during the evidentiary hearing, Dr. Shafrir suggested that if the July 2 vaccination did not *initially cause* G.C.F.'s ASD, it could have "significantly aggravated" that ASD. (Tr. 38.) I will deal with that "significant aggravation" claim later in this Decision, in Section XI.

A. Dr. Wiznitzer is much better qualified to opine concerning autism.

Both Dr. Shafrir and Dr. Wiznitzer are board-certified pediatric neurologists, which gives both at least a basic qualification to opine here, since autism is a neurological diagnosis. However, Dr. Wiznitzer is far *better* qualified to opine concerning *autism*, since he has devoted much of his career to *specializing* in autism.

At Rainbow Babies and Children's Hospital in Cleveland, Dr. Wiznitzer served as Co-Director of the Rainbow Autism Center in 1991, and as the Director of the Rainbow Autism Center from 1992 through 2010. (Ex. B, p. 3.) Although he no longer directs the autism center, he estimates in his current practice at least 25% of his patients have been diagnosed with autism. (Tr. 85.) Of Dr. Wiznitzer's published medical articles, medical text chapters, and medical abstracts, many concern autism. (Ex. B, pp. 13-23.) He has presented numerous lectures at the invitation of community organizations concerning childhood developmental disorders, primarily on the subject of autism. (Ex. B, pp. 24-54.) He has been extensively engaged in autism-related research since 1986. (Tr. 83-86.) He has participated in developing diagnostic tests for autism. (Tr. 86.) He currently is part of a committee of the American Academy of Neurology that develops guidelines for autism management. (*Id.*)

Dr. Shafrir's *curriculum vitae* and testimony show no similar specialization in or extensive experience in the specific field of autism. Therefore, Dr. Wiznitzer's *qualifications* to opine concerning the causation of autism are much superior.[14]

B. Dr. Wiznitzer was a much more persuasive witness in this case.

In addition to being much better qualified, I found that Dr. Wiznitzer was a far more *persuasive* witness in this case as well. As for Dr. Shafrir, I simply did not find him to be a solid, thoughtful, or persuasive witness. As noted in multiple instances above and below, Dr. Shafrir often overstated the significance of the materials upon which he was relying. This was true of both his analysis of the medical literature he cited, as well as his analysis of G.C.F.'s own medical records. He sometimes contradicted himself or changed his testimony. In contrast, Dr. Wiznitzer was far more measured and credible as a witness.

As one glaring example, noted above, Dr. Shafrir repeatedly insisted that G.C.F.'s pediatrician in April 2012 found explicitly that G.C.F. did *not* have autistic symptoms at that time -- when in fact the actual record of the visit of April 3, 2012, tells a much different story, that the pediatrician found generally normal development but was concerned with the head-banging as a *potential* symptom of autism. (See discussion at Section VII(C) above.)

Another example is that Dr. Shafrir first pointed to a *combination* of the MMR and varicella vaccinations administered on July 2, 2012, as causing G.C.F.'s disorder (Ex. 14, p. 25), then at the hearing implicated only the MMR vaccination (Tr. 80). A further example was Dr. Shafrir's inconsistent and confusing testimony as to whether it was the MMR or the varicella

[14] Similarly, in *R.K. v. HHS*, No. 03-632V, 2015 WL 10936124, at *57, 59 (Fed. Cl. Spec. Mstr. Sept. 28, 2015), Special Master Vowell concluded that Dr. Shafrir's experience concerning autism was heavily outweighed by that of the Respondent's expert.

vaccination that caused G.C.F.'s rash some three weeks later. (See discussion at p. 12, fn. 9, above.)

Yet another example of this contrast between the experts was Dr. Shafrir's criticism of Dr. Wiznitzer's testimony regarding the limitations of CDC data of the prevalence of autism. Looking at the actual CDC reports cited by Dr. Shafrir, however, the very points raised by Dr. Wiznitzer were identified as significant limitations by the CDC itself. Thus, Dr. Shafrir seems to have been less than adequately familiar with his own source material. See discussion at Section IX(A) below.

This is not the first time that Dr. Shafrir has been criticized for this very type of inconsistent and unsupported testimony. In particular, in recent cases in which he has testified for petitioners in cases involving vaccinees suffering from *autism*, Dr. Shafrir's testimony has been repeatedly rejected and criticized. For example, in a case where Dr. Shafrir presented a theory similar to his presentation in this case, the special master concluded that "Dr. Shafrir's opinions are wishful thinking premised on unverified and unsupported assumptions." *Lehner v. HHS*, 08-554V, 2015 WL 5443461, at *45 (Fed. Cl. Spec. Mstr. Vowell July 22, 2015.) The special master added that Dr. Shafrir "was unable to explain coherently his theory of causation," that his testimony was "vague" in nature, and that he simply "parroted key phrases, such as molecular mimicry," without being able to explain them well. (*Id*.)

Similarly, in *R.K. v. HHS*, *supra*, the same special master observed that Dr. Shafrir's testimony, again involving a similar causation theory in an autism case, involved "harangues" (*id*. at *68) and "attacks *** leveled without apparent support" (*id*. at *97). She noted that Dr. Shafrir was "fervent but without any support." (*Id*. at *106.) She summarized that the "theories espoused by Dr. Shafrir are unreliable." (*Id*. at *110.) Based on my impression of Dr. Shafrir's performance in this case, I am compelled to concur with Special Master Vowell's comments. See also *R.V. v. HHS*, 08-504V (Fed. Cl. Spec. Mstr. Corcoran Feb. 19, 2016) (rejecting Dr. Shafrir's theory that the vaccinee's autism resulted from an encephalopathy caused by an autoimmune reaction to a vaccination); *Wright v. HHS*, No. 12-423V, 2015 WL 6665600, at *2 (Fed. Cl. Spec. Mstr. Sept. 21, 2015) (special master found Dr. Shafrir's theory of causation in an autism case to be "absurd").

It is also noteworthy that despite advancing a theory steeped in immunology, Dr. Shafrir is not himself an immunologist. To the extent he claimed expertise in neuroimmunology, that assertion is not supported by his *curriculum vitae*. (Tr. 25-26; Ex. 15.) This fact makes Dr. Shafrir's overstatements all the more unpersuasive, because he does not have any established clinical or research background to support statements that are not fully confined to the medical literature he cited. Although Dr. Wiznitzer likewise lacks any background in immunology, the initial burden of proof rests with Petitioner, and the unsupported assertions were Dr. Shafrir's. Dr. Wiznitzer's testimony more closely adhered to the conclusions of the medical literature cited.

For all of these reasons, I conclude that Dr. Wiznitzer was a more credible and more persuasive witness in this case. *See, e.g.*, *Hennessey v. HHS*, No. 01-190V, 2009 WL 1709053, *42 (Fed. Cl. Spec. Mstr. May 29, 2009) ("When experts disagree, many factors influence a fact-finder to accept some testimony and reject other contrary testimony. Objective factors, including the qualifications, training, and experience of the expert witnesses and the extent to which their proffered opinions are supported by reliable medical research, other testimony, and the factual

basis for their opinions, are all significant in determining what testimony to credit and what to reject.").)

IX

DR. SHAFRIR FAILED TO DEMONSTRATE IN GENERAL THAT THE MMR VACCINATION CAN RESULT IN AUTOIMMUNITY CAUSING AUTISM OR AUTISTIC SYMPTOMS

Dr. Shafrir attempted to demonstrate *in general* that the MMR vaccination can cause a chronic autoimmune attack on the brain, resulting in autistic symptoms. This general proposition, however, turned out to be poorly supported, quite speculative, and not persuasive.

A. Dr. Shafrir's theory derives in part from an unsupported assumption that autism is an "epidemic."

Dr. Shafrir's theory is predicated in part upon his unsupported insistence that autism is best understood as an "epidemic." Both experts in this case agreed that autism is a disorder or syndrome rather than a specific disease with a specific cause, and that the causation of autism is not fully understood. (Tr. 28, 134.) Both experts also agreed that at least some ASD cases are explained by known genetic defects. (Tr. 29-30, 131.) Where the two experts disagreed, however, is in the relative prevalence of genetically-based autism. Whereas Dr. Wiznitzer opined that the vast majority of ASD cases will ultimately be explained genetically (Tr. 131), Dr. Shafrir suggested that most cases of ASD are part of a large autism "epidemic," ruling out genetics as a sole cause (Tr. 30-33). That difference of opinion is foundational to Dr. Shafrir's theory; he stressed that, although his purported explanation is just one minor cause of ASD among many (Tr. 56), his theory is supported by the fact that, as an epidemic, autism must *necessarily* have an environmental trigger in many cases (Tr. 30-33, 46, 56, 158).

As far as the record of this case goes, Dr. Shafrir's contention that autism represents an epidemic is based on two sources of information, CDC (Centers for Disease Control) statistics and his own personal observations. (Tr. 30-33, 153-57.) Petitioner has submitted into evidence in this case CDC statistics on the increasing prevalence of autism diagnoses from 2000-2010. (*See* Exs. 60, 63-68.) Dr. Shafir indicated that the CDC data "succinctly describes the autism epidemic," and that he submitted that material "to counteract any possible claim that what [G.C.F.] suffered [was] 'genetic.'" (Ex. 48, p. 3.) He also stressed that his own professional experience is consistent with a steady rise in autism diagnoses. (Tr. 157.)

Dr. Wiznitzer, however, argued that the rise in ASD diagnoses reported by the CDC is not necessarily explained as an actual rise in the *incidence* of autism. (Tr. 138-42.) He noted that there are a number of factors that may contribute to the increasing number of diagnosed cases. Specifically, he noted that there is still disagreement over when to use the ASD label. (Tr. 141-42.) He also suggested that both diagnostic criteria and public awareness have changed over the years, leading to identification and inclusion of less obvious or less severe cases. (Tr. 138-40.) In this regard, Dr. Wiznitzer stressed that the CDC statistics show an increasing IQ level, suggesting that the population being identified has not remained consistent. (*Id*.) Finally,

he also noted that risk factors for autism, such as the age of the parents, has changed over time. (Tr. 140-41.)

I find Dr. Wiznitzer's explanation to be sound. More significantly, however, Dr. Shafrir's position is fatally undercut by his own citations. The CDC reports that petitioner filed in this case explicitly caution against drawing *exactly* the conclusion that Dr. Shafrir has suggested. For example, the Community Report From the Autism and Developmental Disabilities Monitoring (ADDM) Network, filed by Petitioner as Exhibit 61, states that "for such complex conditions like ASDs, no single factor can explain why more children are being identified with ASDs. Some of the increase likely has been due to changes in the diagnosis and treatment of ASDs, some to greater awareness, and some to better record keeping, although exactly how much is due to these factors is unknown." (Ex. 61, p. 43.) Likewise, the yearly data reports themselves stress the same limitation for the interpretation of the data. For example, the surveillance summary for 2008 states that "[t]hese data confirm that the estimated prevalence of ASDs identified in the ADDM network surveillance populations continues to increase. The extent to which these increases reflect better case ascertainment as a result of increases in awareness and access to services or true increases in prevalence of ASD symptoms is not known." (Ex. 68, pp. 3-4.) Thus, Dr. Wiznitzer's testimony better reflects the actual content of the CDC materials than does Dr. Shafrir's.[15]

Nor, for that matter, even if an epidemic increase in autism was established, would that necessarily point to the type of trigger Dr. Shafrir posited in this case. Dr. Wiznitzer opined that to the extent that ASD is not explained by genetics alone, it would involve *pre-natal* factors. (Tr. 130-31, 142-44.) For his part, Dr. Shafrir testified that the environmental factor he cites as necessary to the epidemic would be something "affecting either the mother or the child," suggesting that Dr. Shafrir at least contemplates the possibility that the cause of the epidemic he posits could be prenatal factors, and not necessarily tied to post-natal environmental factors. (Tr. 46-47.) Thus, despite Dr. Shafrir's repeated emphasis, the concept of an autism "epidemic," even if credited, would still be of minimal value in resolving *this case*.

In short, although serious questions obviously remain, there is simply not preponderant evidence in this case that the undisputed rise in *identified* cases of autism is equivalent to a *true increase* in the prevalence of autism. And even if there has been *some* increase, the extent and cause of that increase remain unclear. Dr. Shafrir's eagerness to call it an "epidemic," and to

---

[15] For a further discussion of the issue of the increases in diagnoses of autism in recent years, see *Snyder v. HHS*, No. 01-162V, 2009 WL 332044 (Fed. Cl. Spec. Mstr. Feb. 12, 2009), at *34-35. There, Special Master Vowell discussed the very extensive evidence concerning that issue brought forth in the autism "test cases" cited at Section II of this Decision above. She found that at least part of the increase in diagnoses is explained (as Dr. Wiznitzer testified in this case) by changes in autism definitions, and in better awareness and better ascertainment of autism. (*Id*.) She concluded that it is unclear whether other factors are also in part causative of the increase in diagnoses, but found that overall, the evidence concerning the increase in autism diagnoses did *not* support the idea that vaccines are causing any part of the increase. (*Id*. at *35.)

draw causal inferences from that label, is speculative and premature at best.[16] Moreover, even if I were to accept Dr. Shafrir's testimony regarding epidemic autism at face value, it still would not have the significance to the specific theory that he claims.

B. Dr. Shafrir has not persuasively linked autism to autoimmunity.

Regardless of whether there is an autism epidemic, Dr. Shafrir's theory of autoimmune encephalopathy leading to autism would still be quite speculative. Dr. Shafrir relied upon studies which, when closely examined, *do not* offer strong support to his general theory. Dr. Shafrir's interpretation of the studies that he referenced is questionable at best.

Dr. Wiznitzer, on the other hand, disputed that any of these studies supported Dr. Shafrir's causation theory, and opined that there is not sufficient reason to conclude that autistic symptoms can be caused by chronic autoimmunity. (Tr. 103-124.) For the reasons discussed below, I agree.

1. Dr. Shafrir's own statements admit, in essence, that his autoimmunity theory amounts to mere speculation.

At multiple times, Dr. Shafrir candidly acknowledged the limitations of the state of scientific knowledge regarding autoimmunity and its alleged potential role in autism. He stated that "autoimmune is a very important new concept in neurology" (Ex. 48, p. 3), but conceded that the articles he cited do not prove that autism is an autoimmune disease (Tr. 67-68), and that "we don't talk about proof" when it comes to autoimmune disease (Tr. 61). Indeed, he characterized important aspects of his own theory as unprovable "assumptions." (Tr. 39.) He testified that "unfortunately, the field of autoimmune encephalopathy is in its very beginning, and we don't know to what extent those patients may have autoimmune encephalitis or autoimmune – or autoantibodies against the brain. I think it's something that we'll wait for a lot of research***." (Tr. 46-47.) He acknowledged that Dr. Wiznitzer was correct in saying that one of Dr. Shafrir's cited articles "doesn't prove anything." (Tr. 67.)

After viewing his entire presentation, I conclude that, as Dr. Shafrir himself seemed to acknowledge, his entire general theory concerning a role for autoimmunity in autism amounts to mere speculation.

---

[16] To the extent Dr. Shafrir has urged such speculation as an underlying rationale for accepting his theory, his opinion is diminished in my view. That is, in offering an unqualified opinion that an autism "epidemic" exists, particularly in light of the limitations expressed in his own source material, Dr. Shafrir has again shown his propensity for overstatement. Thus, his general credibility is also diminished.

2. The articles upon which Dr. Shafrir relied do not provide strong support for his theory.

a. Studies which, Dr. Shafrir asserted, show that autoimmunity and immune dysfunction are "established" as causing autism

Dr. Shafrir first cited a number of studies for the proposition that autoimmunity and immune dysfunction play a role in causing autism, contending that such a role is "well-established." (Ex. 14, p. 22.) Dr. Wiznitzer, however, disputed that Dr. Shafrir's references supported his claim that autoimmunity in autism is well-established, or even likely. (Ex. A, p. 8; Tr. 104-24.) Dr. Wiznitzer explained that most of Dr. Shafrir's cited articles involve various autoimmune conditions that are quite *distinct* from autism. (Ex. A, pp. 8-9; Tr. 105-12.) Based upon my own review of these studies, I agree with Dr. Wiznitzer.

For example, the Gesundheit paper is a review article cited among Dr. Shafrir's sources, evaluating prior studies "associating ASD with the immune system." (Ex. 26, p. 1.) Contrary to Dr. Shafrir's assertion, the authors ultimately concluded that "none of these studies sufficiently explain whether the immune system underlies the pathology of ASD in a causative way, whether immune interferences create vulnerability to other pathogens responsible for ASD, or whether a third, yet unknown factor is responsible for both the pathology of ASD and for the aberrant immune response in ASD." (Ex. 26, p. 6.)

Similarly, with regard to Dr. Shafrir's particular contention that autistic children show higher levels of autoantibodies against neuronal cells, the Mazur-Kolecka article concluded that although "[r]ecent developments indicate a possible pathogenic role of autoantibodies in *CNS* [central nervous system] *disorders*," "[i]n *autism*, the potential role of autoantibodies *** is unknown." (Ex. 30, p. 7, emphasis added.) Dr. Wiznitzer further stressed that although the Mazur-Kolecka study found autoantibodies among a higher percentage of children with ASD than without, the study nonetheless found autoantibodies in *both* populations, leaving the significance of the autoantibodies unclear. (Ex. A, p. 8.)

Moreover, an additional study cited by Dr. Shafrir (Ashwood and Van de Water) also cautioned that "the pathophysiological significance of these antibodies reported in children with autism is uncertain." (Ex. 29, p. 559.) The authors further cautioned that "the presence of autoantibodies in the serum of these patients may be a secondary phenomenon." (Ex. 29, p. 560.)

In other words, as Dr. Wiznitzer testified, the authors in a number of the articles on which Dr. Shafrir relied *acknowledged themselves* that their results were merely speculative, not probative, concerning a causal role for autoimmunity in autism. (Tr. 104.) Others of these authors acknowledged that there is "no scientific evidence that vaccinations can be directly associated with the development of autoimmune diseases." (*Id*.)

b. Studies regarding immunosuppressive therapy in ASD

Dr. Shafrir also cited studies purporting to show that immunosuppressive therapy can reverse the course of autism. (Ex. 14, p. 22; Tr. 68-69.) During the hearing, however, Dr. Shafrir himself noted the limited value of these immunosuppressive therapy studies,

acknowledging that they were not controlled and suggesting other unspecified issues with the studies. (Tr. 69.) In any event, these studies are wholly tentative in their conclusions.

For example, the Golla article explicitly states that the efficacy of treating autism with steroids has not been established. (Ex. 35, p. 2.) The Duffy paper states that "[t]he current study does *not* suggest that steroids 'cure' regressive autism nor does it claim proof of the value of pharmacological treatment of regressive autism." (Ex. 34, p. 17 (emphasis in original).) The Chez article, a review article of prior studies on the subject, concludes by noting significant shortcomings among prior studies and stating that further studies are "desperately needed." (Ex. 33, p. 7.)

c. Articles reporting on anti-VGKC antibodies and anti-NMDAR antibodies as causes of autoimmune encephalitis.

Dr. Shafrir also cited several studies (Exs. 36-40) involving anti-VGKC[17] antibodies and anti-NMDAR[18] antibodies, as alleged evidence that autoimmune encephalitis has been described as a cause of autism. (Ex. 14, p. 22.) Dr. Wiznitzer did not dispute the diagnosis of autoimmune encephalitis among the subjects of those studies, but contended that the clinical picture of those subjects is different from the usual clinical picture of autism (Tr. 107-10), and not comparable to G.C.F.'s clinical history. (Ex. A, pp. 8-9.) He testified that the autoimmune encephalitis profile described in those studies "is not the autistic spectrum disorder that is described in this case." (Tr. 110.)

Dr. Shafrir sought to counter Dr. Wiznitzer's observation by contrasting the brief case descriptions contained in the encephalitis articles against the many pages of G.C.F.'s medical records in evidence. (Tr. 70.) Dr. Shafrir contended that the fact that G.C.F. exhibited symptoms of autism in addition to those described in the studies should not be viewed as significant. (*Id*.) Dr. Wiznitzer's observation, however, is not so easily dismissed. Dr. Wiznitzer did not merely observe that G.C.F. had additional ASD symptoms relative to the study subjects, he opined that the usual clinical picture of autism, as well as G.C.F.'s own clinical history, is *clearly distinct* from those known to be experiencing encephalitis. (Ex. A, pp. 8-9; Tr. 110.)

Significantly, in addition to opining that G.C.F. exhibited significant ASD symptoms such as restricted interests and repetitive behaviors not seen among the encephalitis study subjects, Dr. Wiznitzer also identified the presence of additional symptoms of encephalitis among the study subjects, symptoms which are *not* found in G.C.F.'s history. (Ex. A, pp. 8-9.) Specifically, he noted that these studies found the subject children to have experienced loss of established language progressing to mutism, movement disorders, swallowing problems, and seizure disorders, none of which G.C.F. exhibited. (Ex. A, p. 8.)

---

17 "VGKC" stands for voltage-gated potassium channel. (*See, e.g.*, Ex. 36, p. 1.)

18 "NMDAR" stands for N-methyl-d-aspartate receptor." (*See, e.g.*, Ex. 37, p. 2.)

Moreover, Dr. Wiznitzer persuasively testified that G.C.F.'s additional ASD symptoms are also significantly different from symptoms of NMDAR encephalitis. At the hearing, Dr. Wiznitzer stressed that patients with NMDAR encephalitis experience neurobehavioral or neuropsychiatric problems such as seizure, catatonia, withdrawn behavior, and mutism. (Tr. 105-06.) He explained that while some of these behaviors can be mistaken for signs of autism at a superficial level in young children, the difference between autistic behaviors and encephalitis is distinct among teens and adults. (*Id*.) In that regard, Dr. Wiznitzer opined that G.C.F.'s additional ASD behaviors such as repetitive movements and restricted interests represent an additional diagnostic prong under the standard criteria for autism diagnosis that is *not* present among those experiencing encephalitis. (Tr. 106-07.) Contrary to Dr. Shafrir's suggestion that the absence of those symptoms among the encephalitis study subjects is simply an issue of brevity, Dr. Wiznitzer opined that those symptoms are highly relevant to distinguishing between encephalitis and autism. (Tr. 107.)

Additionally, Dr. Wiznitzer further noted that the NMDAR encephalitis study subjects demonstrated no improvement absent immunotherapy. (Ex. A, p. 8.) Unlike those with autoimmune encephalitis, however, G.C.F. *did improve* over time *without* immunotherapy, which is consistent with the expected prognosis for ASD, which Dr. Wiznitzer described as a course of variable improvement. (Ex. A, p. 8; Tr. 149-50.)

Significantly, Dr. Shafrir did not himself attempt to explain how a typical autism clinical picture, or G.C.F.'s own clinical history, could be viewed as conforming to an NMDAR encephalitis or VGKC encephalitis diagnosis, leaving Dr. Wiznitzer's opinion virtually unchallenged. The fact that these studies suggest that certain presentations of these types of encephalitis may include some symptoms potentially consistent with ASD is of small import, when the typical autism course and G.C.F.'s own clinical course *remain distinct* from such encephalitis, and there is no evidence to suggest that G.C.F. ever experienced encephalitis.

For all these reasons, I found that the literature concerning the autoimmune encephalitis cases did not provide strong support for Dr. Shafrir's theory that *autism* can be the result of autoimmunity.

d. The Kayser/Dalmau and Obregon articles

In further support of his autoimmunity theory, Dr. Shafrir cited studies by Kayser and Dalmau, and by Obregon, *et al*. (Ex. 14, pp. 23-24; Exs 40-41.) According to Dr. Shafrir, these studies show a connection between autoimmune encephalitis and autism, because they show antibodies targeting a brain protein known as "Caspr2." (Ex. 14, pp. 23-24.) The Kayser/Dalmau article, however, posits a link between autoimmunity and *some* forms of neuropsychiatric disease, but does not say that *autism* can be the result of autoimmunity. (Ex. 40.) And Dr. Dalmau himself testified for the Respondent in another Program case in which Dr. Shafrir presented a similar causation theory, and opined that "based on his own experience in investigating and researching autoimmune encephalitis, vaccination does not play any role in its development." (*Lehner v. HHS*, 2015 WL 5443461 at *48.)

Dr. Shafrir put particular stress on the Obregon article, which he cited for the proposition that the *MMR vaccine* could cause antibodies to attack the Caspr2 protein, thereby causing injury

to the brain. (Tr. 38-40; Ex. 41, p. 24.) Specifically, Dr. Shafrir contended that the Obregon study demonstrated "homology"[19] between certain proteins in the measles, mumps, and rubella viruses, and amino acid sequences in the Caspr2 protein. (Ex. 14, p. 24.) According to Dr. Shafrir, such homology makes the Caspr2 protein a likely candidate for "molecular mimicry," in which, Dr. Shafrir suggested, antibodies created by the immune system to attack the MMR viruses instead attack the Caspr2 protein in the brain. (*Id*.) Dr. Shafrir further stressed that the Caspr2 protein has itself been associated with autism.[20] (Tr. 39-40; Ex. 14, p. 24.) (The Caspr2 protein is also known as the CNTNAP-2 protein.) (Ex. 41, p. 2 of 17.)

Dr. Wiznitzer, however, raised a number of criticisms of the Obregon study, which Dr. Shafrir left completely unrebutted. (Tr. 113-21.) First, Dr. Wiznitzer questioned the purported finding of homology. According to Dr. Wiznitzer, the Obregon study looked at a "very small" sequence of amino acid and *added to* that sequence in order to match the sequence in the vaccine. (Tr. 114-15.) This means that the vaccine and the Caspr2 protein are *not* homologic, and therefore leaves the study resting on an unsupported assumption. (Tr. 115.) Moreover, Dr. Wiznitzer contended that homology by itself would still not be sufficient to prove that molecular mimicry is occurring.[21] (Tr. 123-24.) Next, Dr. Wiznitzer challenged the study's finding that the Caspr2 protein is associated with autism. (Tr. 115-16.) Dr. Wiznitzer noted that the study population, with 18 controls and 26 autistic subjects, was very small. (Tr. 116.) He also noted that the two groups were mismatched in age and sex ratio. (*Id*.) Importantly, the study authors themselves acknowledge these very limitations and characterized them as "significant." (Ex. 41, p. 13.) Dr. Wiznitzer pointed out additional problems with the Obregon article, and summarized that "the Obregon paper is of no value in this hearing at all. *** There are too many flaws in it, too many mistakes in it for it to have any practical utility." (Tr. 121.)

Although Dr. Shafrir further addressed the Obregon study in his rebuttal testimony, he did not address these specific points of Dr. Wiznitzer concerning the reliability of the findings. (Tr. 157-58, 159-60.) Moreover, Dr. Shafrir appeared to concede that the Obregon study suffers significant weaknesses, characterizing it only as a "pathfinder study" in need of replication. (Tr. 157-58.) He acknowledged that the article "doesn't prove anything at this point," but merely

---

[19] "Homology" means, in the context of our autoimmunity discussion, that the Caspr2 protein is alleged to be *similar enough in molecular structure* to proteins in the MMR vaccine that the immune system mistakenly attacks the Caspr2 protein. (*See* Tr. 114.)

[20] In his expert report, Dr. Wiznitzer was critical of Dr. Shafrir's citation in his own report of the Kayser and Dalmau study. (Ex. A, p. 9.) Dr. Shafrir quoted language suggesting that autoantibodies against Caspr2 have been found in cases of autoimmune encephalitis with autistic-like symptoms. (Ex. 14, p. 23.) Dr. Wiznitzer intimated that Dr. Shafrir had misleadingly truncated the quotation, noting that the complete quote described additional symptoms that made clear that the condition examined, including the purported Caspr2 genetic link to autism, does not match G.C.F.'s clinical presentation. (Ex. A, p. 9.)

[21] Dr. Shafrir agreed with Dr. Wiznitzer that homology is not enough in itself to demonstrate autoimmunity. (Tr. 55.)

suggests a "possible" way by which the MMR vaccination might cause the onset of autism. (Tr. 55.)

e. The narcolepsy articles

Dr. Shafrir attempted to further bolster his theory by submitting a supplemental expert report (Ex. 48), in which he cited a number of articles regarding cases of a condition known as "narcolepsy" reported following administration of a Pandemrix influenza vaccine in Finland. He contended that the narcolepsy cases support his theory by providing an example of the same mechanism of autoimmunity proposed in this case -- *i.e.*, molecular mimicry resulting in autoimmune attacks against brain proteins. (Ex. 48, pp. 1-2.) Dr. Shafrir acknowledged during the hearing, however, that these studies do not even establish that narcolepsy actually is an autoimmune condition, rendering the comparison meaningless. (Tr. 60.) In any event, I do not see how evidence of a *different vaccine* possibly acting via molecular mimicry upon a *different target* to produce a *different injury* significantly supports Dr. Shafrir's theory of causation in *this case*. The narcolepsy cases tell us nothing about whether *autism* can be a product of autoimmunity and, if so, whether it could be triggered by the MMR vaccine at issue in this case. Dr. Wiznitzer additionally noted (Ex. C, p. 1; Tr. 111-13) that the relationship between Pandemrix and narcolepsy was supported by positive *epidemiological studies* showing a statistical association between that vaccine and narcolepsy, whereas the epidemiological evidence regarding MMR and autism shows *no association*. (See Ex. F, pp. 145-48, and discussion at Section IX(C)(1) of this Decision, below.)

f. Summary concerning articles on which Dr. Shafrir relied

In short, I have reviewed all of the articles upon which Dr. Shafrir relied for his theory that autoimmunity can cause autism *in general*, and the discussions of those articles by Drs. Shafrir and Wiznitzer. Based on that review, I acknowledge that some of these articles, and the articles taken as a whole, suggest the *possibility* of a role for autoimmunity in autism. However, that possibility has certainly *not* been proven likely to the level of "more probable than not." I am not persuaded that the articles provide more than mere *tentative* or *theoretical* support for Dr. Shafrir's suggestion that autism can be the result of autoimmunity. In fact, it is clear that Dr. Shafrir overstated the findings of the studies he submitted. The papers cited by Dr. Shafrir for the most part are far more tentative than he suggested, and provide only weak evidence of a *possible* association between autoimmunity and autism. Dr. Shafrir admitted as much during the hearing, effectively endorsing Dr. Wiznitzer's critique and conceding that none of the articles he cited establish autoimmunity as a cause of autism. (Tr. 67-68.) According to Dr. Shafrir, the studies "just demonstrated that those autoantibodies exist," not that they cause autism. (Tr. 68.) Particularly in light of all the other shortcomings of Dr. Shafrir's presentation, this is simply inadequate.

3. Summary: Dr. Shafrir has not adequately supported his general theory that autoimmunity can cause autism.

In short, for all of the reasons set forth in this Section IX(B) of this Decision, I find that Dr. Shafrir has not demonstrated his *general theory* that it is "more probable than not" that

autism can be caused by autoimmunity. I found Dr. Wiznitzer's testimony to the contrary to be more persuasive.

To be sure, some of the studies cited by Dr. Shafrir at least raise a credible *question* concerning whether autistic symptoms *might* in some cases be the product of autoimmunity. This general question may be the subject of further study. However, based on the evidence in the record of this case, I find that it has not been shown to be "more probable than not" that autism can be caused by autoimmunity.[22]

C. Even assuming that autoimmunity can result in autistic symptoms, there has been no showing that the MMR vaccine can cause such autoimmunity.

Even if Dr. Shafrir were able to demonstrate that it is probable that autistic symptoms can be caused by autoimmunity (which he has not), he would still need to demonstrate that it is probable that the *MMR vaccination* can cause such autoimmunity. This he has also failed to do.

1. Published studies concerning MMR and autism make Dr. Shafrir's MMR/autoimmunity theory seem unlikely.

Respondent filed excerpts from an extensive 2012 report of the Institute of Medicine (IOM), which specifically evaluated whether there is a causal relationship between the *MMR vaccine* and autism. (Ex. F.) The IOM Committee's conclusion, considering all the available evidence on the issue, was that the "evidence favors *rejection* of a causal relationship between MMR vaccine and autism." (*Id*., p. 153, emphasis added.)

Further, the IOM Committee evaluated multiple *epidemiologic* studies which examined the question of whether any association exists between the MMR vaccination and autism. All of the studies that the Committee found most probative, found *no association* between the MMR vaccine and autism. (Ex. F, pp. 145-48.)

Of course, if MMR were causing only a very small percentage of autism cases, these epidemiologic studies might not have had sufficient power to identify an association; epidemiologic studies, by their very nature, cannot prove for *certain* that Factor A *never* causes Condition B. However, especially since Dr. Shafrir urges that MMR vaccines are contributors to a large "epidemic" of autism, both the findings of the epidemiologic studies described above, and the conclusion of the IOM Committee, tend to cast significant *doubt* on Dr. Shafrir's theory.

---

[22] In another recent Vaccine Act case, Dr. Shafrir similarly testified that a vaccine (in that case an influenza vaccine) could cause an autoimmune reaction, resulting in autism or in an encephalopathy manifesting as autistic symptoms. *R.K. v. HHS*, No. 03-632V, 2015 WL 10936124, at *103-04 (Fed. Cl. Spec. Mstr. Sept. 28, 2015). In that case, he relied upon some of the same articles and arguments that he raised in this case. *Id*. at *105-06. Special Master Vowell rejected Dr. Shafrir's autoimmunity theory. (*Id*. at *92, 101-06.) She found one part of that theory to be "completely speculative." (*Id*. at *105.) She also found that his attempt to "demonstrate the capacity of the vaccine to cause such [an autoimmune] reaction were not only circular, they utterly failed." (*Id*. at *109.)

2. Dr. Shafrir's attempt to theorize <u>how</u> the MMR vaccine might trigger autoimmunity was not persuasive.

In Section IX(B)(2)(d) above, I have already discussed Dr. Shafrir's attempt to show that the *MMR vaccine* could prompt an autoimmune attack on the brain as the result of an alleged similarity ("homology") between certain proteins in the measles, mumps, and rubella viruses and amino acid sequences in the Caspr2 brain protein. For the reasons set forth in that section, I found Dr. Wiznitzer's criticisms of the Obregon study to be persuasive, and Dr. Shafrir's approach to be less than persuasive.

Thus, even if it were to be assumed that autoimmunity can play a role in autism, nevertheless it has not been shown to be probable that the *MMR vaccine* could cause an ongoing autoimmunity condition resulting in autistic symptoms.[23]

X

THERE IS NO EVIDENCE OF ANY ABNORMAL IMMUNE REACTION OR ANY AUTOIMMUNITY IN G.C.F.

Even if Dr. Shafrir had demonstrated *in general* that the MMR vaccine *can* result in autoimmunity causing autism or autistic symptoms, he still failed to show that such an occurrence caused the specific autism or autistic symptoms of *G.C.F*. Since Dr. Shafrir theorized that G.C.F.'s injury is explained as autoimmune encephalopathy manifesting as ASD (Tr. 40-41), his opinion is predicated on the idea that G.C.F. himself had an immune dysfunction and/or an abnormal immune reaction to his vaccination in question. However, G.C.F.'s own medical history does *not* establish that any such abnormality or reaction existed in G.C.F.

For example, Dr. Shafrir acknowledged that there was never any test performed in G.C.F.'s case that would demonstrate the autoimmune response that he has theorized. (Tr. 39,

---

[23] Petitioner stresses in her post-hearing reply brief, filed March 7, 2016, that a petitioner need not show the exact mechanism of injury (p. 6), and that a petitioner need not demonstrate that her theory is "generally accepted" in the medical community (p. 7). Petitioner is correct on both of these legal points. If a petitioner can show, based upon the overall record, that an injury was "more likely than not" caused by a vaccination, then that petitioner becomes entitled to a Program award whether or not the *mechanism* of injury is demonstrated, or the petitioner's medical theory has gained "general acceptance." In this case, however, I found Dr. Shafrir's overall presentation to be speculative, dubious, and less persuasive than the presentation of Dr. Wiznitzer. Based on the entire record, I do not find it to be "more probable than not" either that the MMR vaccine *can* cause or aggravate autism by *any* mechanism, or that it *did* cause or aggravate *G.C.F*.'s autism.

Further, I note that in reaching my resolution of this case I have fully considered both of the post-hearing briefs filed by Petitioner.

78.) Similarly, Dr. Wiznitzer stressed that G.C.F. never displayed any symptoms that would reasonably have prompted referral to an immunologist. (Tr. 122-23.) Dr. Shafrir also acknowledged that there was no EEG, MRI, or other evaluation, that would have tested for encephalopathy. (Tr. 45.) Dr. Shafrir failed to point to any indication that any of G.C.F.'s *treating physicians* believed that his autistic symptoms were the result of an autoimmune encephalopathy, or that G.C.F. was referred to an immunologist.

Instead, Dr. Shafrir stated that in the absence of any testing that showed a defective immune system or autoimmunity, he based his opinion of an autoimmune encephalopathy "[o]n the symptoms and the time course" of G.C.F.'s condition. (Tr. 78.) But Dr. Shafrir failed to explain that answer in any persuasive fashion. Of course, he did express the belief (an incorrect belief, as shown above in Section VII of this Decision) that G.C.F.'s first symptoms of autistic behavior arose in the three-month period soon after his MMR vaccination of July 2012, but even if that belief were true, that would not support a conclusion that an *autoimmune* reaction was attacking G.C.F.'s brain.

Dr. Shafrir did point to one symptom of G.C.F. that he claimed supported his autoimmunity theory -- the severe rash which G.C.F.'s pediatrician described on July 24, 2012. (Ex. 11, p. 94.) Although Dr. Shafrir conceded that the rash itself was not evidence of autoimmunity, he opined that the severity of the rash provided evidence that G.C.F. had an abnormal immune system and was susceptible to autoimmunity. (Tr. 78-79.) This assertion, however, was entirely unsupported. Although rashes are well-known reactions to both the MMR and varicella vaccinations,[24] Dr. Shafrir provided no explanation or citation to support his contention that such a reaction, if severe enough, could constitute evidence of an abnormal immune system. Dr. Shafrir ultimately conceded that "the rash had nothing to do with autoimmune." (Tr. 78.) His only potential explanation was to assert that, since G.C.F. was prescribed acyclovir, a varicella treatment, his immune system must have had difficulty handling the vaccine strain of the virus. (Ex. 14, p. 19.) However, there is no notation in G.C.F.'s medical records suggesting that the pediatrician felt that G.C.F. had an abnormal immune system, or should see an immunologist.

For his part, Dr. Wiznitzer disputed Dr. Shafrir's contentions concerning G.C.F.'s rash and immune system. Dr. Wiznitzer indicated that there is no available literature suggesting that the severity of one's rash is indicative of one's immune status. (Tr. 122.) Dr. Wiznitzer found in G.C.F.'s records no evidence supporting the idea that his ASD was caused by an autoimmune reaction. (Tr. 103.) Significantly, neither Dr. Shafrir nor Dr. Wiznitzer is an immunologist.[25] This fact is particularly significant in terms of Dr. Shafrir's attempt, based on minimal to no

---

[24] For example, Dr. Wiznitzer testified that reports of adverse events following immunization show that between 5-20% will develop a rash. (Tr. 121.)

[25] During the hearing, Dr. Shafrir did testify that he has treated a number of patients experiencing severe neuroimmunological conditions. (Tr. 25.) However, nothing in his testimony establishes that treating neuroimmunological conditions is a significant part of his practice. (Tr. 25-26.) Moreover, nothing in Dr. Shafrir's CV suggests that he has focused on neuroimmunology or immunology in any significant way. (Ex. 15.)

evidence, to establish that G.C.F. had an abnormal immune system, especially since the *Petitioner* bears the burden of proof in this case. After considering the testimony of both experts, I was *not* persuaded by Dr. Shafrir that G.C.F.'s rash constituted evidence that he had an abnormal immune system.

In sum, there is no significant evidence in the record to suggest that G.C.F. had an abnormal immune system, or suffered from autoimmune encephalopathy as Dr. Shafrir suggests. Concerning G.C.F.'s rash, Dr. Shafrir has presented no basis, other than his own *ipse dixit* as a non-immunologist, to conclude that such a rash is evidence of any immune system abnormality. Thus, even if I were to accept the validity of Dr. Shafrir's *general* theory that autoimmunity could cause autism, it would be pure speculation to assert that it could explain *G.C.F.*'s autism.

XI

"SIGNIFICANT AGGRAVATION" CLAIM

A. General

As noted above, Dr. Shafrir spent all of his expert reports, and virtually all of his hearing testimony, on his theory that the MMR vaccination of July 2, 2012 caused the *initial onset* of G.C.F.'s autism symptoms. However, at one point in his testimony he was asked a leading question by his counsel:

> **Q**: Now, if the head banging -- the earlier head banging from a couple of months before, *** if that were a symptom of autism, would you then say that the vaccines given on July 2 significantly aggravated that condition?
>
> **A**: Yes.

(Tr. 38.) Thus, by merely saying "yes," Dr. Shafrir in effect presented a "significant aggravation" argument, as an alternative to his primary argument that the MMR vaccination of July 2, 2012, caused the *initial onset* of G.C.F.'s autism spectrum disorder.

However, the above-quoted question and answer constituted the *entirety* of Dr. Shafrir's discussion of his alternative "significant aggravation" claim. Dr. Shafrir never *explained* that claim. Thus, I must reject it as unexplained.

Of course, presumably Dr. Shafrir would say, if questioned, that his "significant aggravation" claim would be based on the same proposed causal mechanism as his "initial onset" theory -- *i.e.*, that the MMR vaccine caused G.C.F.'s immune system to attack his own brain. However, for the reasons stated above, I have found that Dr. Shafrir failed to demonstrate that it is "more probable than not" that autism *can* be the result of an autoimmune encephalopathy, or that the MMR vaccine *can* cause such an autoimmune encephalopathy, or that his MMR vaccine *did* initially cause *G.C.F.'s own* autism symptoms via this mechanism. For the same reasons, I also find that there is no good reason to believe that G.C.F.'s MMR vaccination of July 2, 2012 "*significantly aggravated*" his already existing autism.

B. Temporal relationship

Although Dr. Shafrir never added any explanation to his one-word alternative "significant aggravation" claim quoted above, I do note that he made some comments suggesting a *temporal relationship* between G.C.F.'s MMR vaccination of July 2, 2012, and his autism symptoms. I note here that I have considered these comments, but find that they offer no significant support to a conclusion that the MMR vaccination caused either the initial onset or a significant aggravation of G.C.F.'s autism.

At one point, Dr. Shafir pointed (Tr. 77) to the statement in the pediatric record of July 24, 2012, that G.C.F. had "not been doing too well" since July 2 (Ex. 11, p. 94). He implied that the "not been doing too well" referred to the onset or increase of autistic symptoms. But that statement that G.C.F. "has not been doing too well" is much more likely explained, as Dr. Wiznitzer testified (Tr. 97-98), by the fact that in the week after July 2, G.C.F. had a *severe croup infection*, which caused him to be *hospitalized*. (Ex. 11, p. 95; Ex. 2, pp. 1-5 of 19.) During his testimony, Dr. Shafrir acknowledged the croup diagnosis, and agreed that it was infectious and *unrelated* to G.C.F.'s vaccinations. (Tr. 42-43.) Thus, the "not been doing too well" notation *does not* imply that G.C.F. had a sudden spike in *autistic* symptoms in the three weeks after his July 2 MMR vaccination. Indeed, the record of July 24, 2012, constitutes important evidence to the *contrary*. If in fact G.C.F. had a sharp increase in autistic symptoms in the three-week period prior to July 24, 2012, such increase most likely would have been noted at the pediatrician visit of July 24.[26]

Next, Dr. Shafrir noted the fact that over a *three-month period* after the July 2 vaccination, G.C.F. undoubtedly did have a significant increase in his autistic symptoms. That is, before July 2, G.C.F. had *some* autistic symptoms -- the head-banging, the sleep disturbance, and the incipient language delays that caused his parents to say in October of 2012 that the onset of his language delays occurred at "7-12 months" or "11 months." (See discussion at Section VII(B) above.) But by October 3, 2012, G.C.F. undoubtedly had much stronger symptoms of

[26] In this regard, I note that in resolving this case, I have not failed to consider the testimony of the Petitioner, G.C.F.'s mother, who testified at the evidentiary hearing. I have no reason to conclude that Mrs. Cunningham was not presenting her best memory of the events of 2012. Indeed, for the most part, Mrs. Cunningham's testimony did not differ from the description of those events contained in the medical records. However, at one point, she testified that a "couple days" after his hospitalization of July 7-8, 2012, G.C.F. became "disconnected," and at some unspecified time, apparently soon afterward, he stopped talking, socializing, and making eye contact. (Tr. 14.) I do not doubt that G.C.F. exhibited those behaviors at *some point* in time prior to October of 2012, but I cannot accept as *accurate* that those behaviors took place *suddenly, within a few days* of that hospitalization, as Mrs. Cunningham's testimony may have implied. If such an abrupt behavioral change had occurred at that time, G.C.F.'s mother very likely would quickly have taken him to his pediatrician. Moreover, if those symptoms had in fact taken place prior to his pediatrician visit on July 24, 2012, those symptoms would certainly have been reported during that visit.

autism -- greater language delay, repetitive use of toys, inconsistent response to his name, poor eye contact, etc. (Ex. 5, pp. 40-41.)

However, the fact that G.C.F.'s autistic symptoms worsened in the three-month period after July 2, 2012, does *not* support a finding that his MMR vaccination "significantly aggravated" his autism. First, Dr. Shafrir never so testified. Second, Dr. Wiznitzer explained that G.C.F.'s overall course of autistic symptoms fit within one of the *typical courses* of symptoms in an autistic individual. (Ex. A, p. 7; Tr. 100-02.) In other words, G.C.F.'s autistic symptoms happened to worsen during that time period, as part of the *ordinary course* of his autism. Therefore, I do *not* find that G.C.F.'s tragic worsening of autistic symptoms between July 2 and October 3 of 2012 supports a conclusion that he experienced a "significant aggravation" of his pre-existing autism as a result of his MMR vaccination of July 2, 2012.

XII

PETITIONER'S CASE FAILS THE TESTS REQUIRED BY *ALTHEN* AND *LOVING*

In this part of my Decision, I will explain how this case fits specifically within the interpretive standards set forth in the *Althen* and *Loving* decisions. (As noted in Section I above, *Althen* provides the legal framework for attempts to establish "initial causation," while *Loving* provides the framework for evaluating "significant aggravation" claims.) The short answer is that I find that Petitioner's case clearly does *not* satisfy the standards presented in either *Althen* or *Loving*.

In this regard, as previously noted, Dr. Shafrir devoted all of his expert reports, and all but one word of his hearing testimony, to the claim that the MMR vaccination of July 2, 2012 *initially caused* G.C.F.'s autism or autistic symptoms. But as explained in Section XI, Dr. Shafrir also briefly suggested that the vaccination *significantly aggravated* a preexisting autism spectrum disorder. It is clear that Petitioner has clearly failed to provide adequate evidence for either claim, for the reasons set forth in detail above. But, in this Section of my Decision, I will analyze Petitioner's case first under *Althen*, summarizing why I have rejected Petitioner's "initial causation" argument. Then I will analyze Petitioner's case under the six-part *Loving/Althen* test, summarizing my rejection of their alternative "significant aggravation" claim.

A. Applying the Althen standard to Petitioner's "initial causation" claim

First, I will analyze the Petitioner's "initial causation" claim, utilizing the *Althen* standard.

The U.S. Court of Appeals for the Federal Circuit declared in *Althen* that it is a petitioner's burden:

> to show by preponderant evidence that the vaccination brought about her injury by providing: (1) a medical theory causally connecting the vaccination and the injury; (2) a logical sequence of cause and effect showing that the vaccination was the reason for the injury; and (3) a showing of a proximate temporal relationship between vaccination and injury.

Althen, 418 F.3d at 1278 (citations omitted). There can be no doubt whatsoever that the *Althen* test ultimately requires that, as an overall matter, a petitioner must demonstrate that it is "more probable than not" that the particular vaccine was a substantial contributing factor in causing or aggravating the particular injury in question. That is clear from the statute itself, which states that the elements of a petitioner's case must be established by a "preponderance of the evidence." (§ 300aa-13(a)(1)(A).) In the pages above, of course, I have already set forth *in detail* my analysis in rejecting Petitioners' "actual causation" theory, including their "initial causation" portion of that theory, in this case. In this part of my Decision, then, I will briefly explain how that analysis fits specifically within the three parts of the *Althen* test, enumerated in the first sentence of the *Althen* excerpt set forth above. The short answer is that I find that Petitioners "initial causation" claim in this case clearly does *not* satisfy the *Althen* test.

1. Relationship between Althen Prongs 1 and 2

One interpretive issue with the *Althen* test concerns the relationship between the first two elements of that test. The first two prongs of the *Althen* test, as noted above, are that the petitioners must provide "(1) a medical theory causally connecting the vaccination and the injury; [and] (2) a logical sequence of cause and effect showing that the vaccination was the reason for the injury." Initially, it is not absolutely clear how the two prongs differ from each other. That is, on their faces, each of the two prongs seems to require a demonstration of a "causal" connection between "the vaccination" and "the injury." However, a number of Program opinions have concluded that these first two elements reflect the analytical distinction that has been described as the "can cause" vs. "did cause" distinction. That is, in many Program opinions issued prior to *Althen* involving "causation-in-fact" issues, special masters or judges stated that a petitioner must demonstrate (1) that the *type* of vaccination in question *can* cause the *type* of injury in question, and also (2) that the *particular* vaccination received by the specific vaccinee *did* cause the vaccinee's *own* injury. *See, e.g., Kuperus v. HHS*, 2003 WL 22912885, at *8 (Fed. Cl. Spec. Mstr. Oct. 23, 2003); *Helms v. HHS*, 2002 WL 31441212, at *18 n. 42 (Fed. Cl. Spec. Mstr. Aug. 8, 2002). Thus, a number of judges and special masters of this court have concluded that Prong 1 of *Althen* is the "can cause" requirement, and Prong 2 of *Althen* is the "did cause" requirement. *See, e.g., Doe 11 v. HHS*, 83 Fed. Cl. 157, 172-73 (2008); *Nussman v. HHS*, 83 Fed. Cl. 111, 117 (2008); *Banks v. HHS*, 2007 WL 2296047, at *24 (Fed. Cl. Spec. Mstr. July 20, 2007); *Zeller v. HHS*, 2008 WL 3845155, at *25 (Fed. Cl. Spec. Mstr. July 30, 2008). And, most importantly, the *Federal Circuit* confirmed that interpretation in *Pafford*, ruling explicitly that the "can it?/did it?" test, used by the special master in that case, was equivalent to the first two prongs of the *Althen* test. *Pafford v. HHS*, 451 F.3d at 1352, 1355-56 (Fed. Cir. 2006). Thus, interpreting the first two prongs of *Althen* as specified in *Pafford*, under Prong 1 of *Althen* a petitioner must demonstrate that the *type* of vaccination in question can cause the *type* of condition in question; and under Prong 2 of *Althen* that petitioner must then demonstrate that the *particular* vaccination did cause the *particular* condition of the vaccinee in question.

Moreover, there can be no doubt whatsoever that the *Althen* test ultimately requires that, as an overall matter, a petitioner must demonstrate that it is "more probable than not" that the particular vaccine was a substantial contributing factor in causing the particular injury in question. That is clear from the statute itself, which states that the elements of a petitioner's case must be established by a "preponderance of the evidence." § 300aa-13(a)(1)(A). And, whatever is the precise meaning of Prongs 1 and 2 of *Althen*, the overall evidence *in this case* falls far

short of demonstrating that it is "more probable than not" that the MMR vaccine that G.C.F. received on July 2, 2012, contributed to the causation of his tragic neurodevelopmental disorder.

2. Petitioner has failed to establish Prong 1 of Althen in this case.

As explained above, under Prong 1 of *Althen* a petitioner must provide a medical theory demonstrating that the *type* of vaccine in question *can* cause the *type* of condition in question. Petitioner's primary theory in this case is that G.C.F.'s MMR vaccination of July 2, 2012 *initially caused* G.C.F.'s autism or autistic symptoms, via an autoimmune process. However, as described above in Sections VIII and IX, Dr. Shafrir has *not* demonstrated that the MMR vaccination *can* cause an autism spectrum disorder or autistic symptoms. Thus Petitioner's claim clearly fails under *Althen* Prong 1.

3. Petitioner has failed to establish Prong 2 of Althen in this case.

Under Prong 2, the Petitioner needs to show that it is "more probable than not" that G.C.F.'s MMR vaccination of July 2, 2012, *did* initially cause *G.C.F*.'s *own* condition. But this they have also failed to do, for all of the reasons detailed above in Sections VII, VIII, and X of this Decision.

4. Petitioner has failed to establish Prong 3 of Althen in this case.

Since I have explained why Petitioner has failed to satisfy the *first* and *second* prongs of *Althen*, I need not discuss why Petitioner's case also fails to satisfy the *third* prong, in which the Petitioner must show that the *timing* of the onset of symptoms fits the Petitioner's causation theory. However, as discussed above in Section VII, the evidence shows that G.C.F. was suffering from an autism spectrum disorder *prior* to the vaccination in question, so that clearly Petitioner has failed to establish Prong 3 in this case, as well.

B. Applying the Loving/Althen standard to Petitioner's "significant aggravation" claim

As explained at Section XI above, Petitioner's unexplained alternative "significant aggravation" claim must also be rejected, for the reasons set forth therein. However, in the interest of completeness, I will now address why Petitioner's "significant aggravation" claim clearly fails the *Loving*/*Althen* standard.

1. Analysis of a "significant aggravation" issue is guided by the ruling in Loving.

The Vaccine Act states that "[t]he term 'significant aggravation' means any change for the worse in a preexisting condition which results in markedly greater disability, pain or illness accompanied by substantial deterioration of health." §300aa-33(4).

The elements of an off-Table significant aggravation case were set forth in *Loving v. HHS*, 86 Fed. Cl. 135, 144 (2009). The United States Court of Appeals for the Federal Circuit acknowledged that "the *Loving* case provides the correct framework for evaluating off-table significant aggravation claims," in *W.C. v. HHS*, 704 F.3d 1352, 1357 (Fed. Cir. 2013). Thus, the Federal Circuit Court of Appeals, which sets binding precedent for decisions by the Office of Special Masters, endorsed the use of a six-part test for significant aggravation, which was first

elaborated in *Loving*. A petitioner must prove by preponderant evidence that a vaccination caused significant aggravation by showing:

> (1) the person's condition prior to administration of the vaccine, (2) the person's current condition (or the condition following the vaccination if that is also pertinent), (3) whether the person's current condition constitutes a 'significant aggravation' of the person's condition prior to vaccination, (4) a medical theory causally connecting such a significant worsened condition to the vaccination, (5) a logical sequence of cause and effect showing that the vaccination was the reason for the significant aggravation, and (6) … a proximate temporal relationship between the vaccination and the significant aggravation.

W.C. v. HHS, 704 F.3d at 1357 (Fed. Cir. 2013).

The standard elaborated in *Loving*, and endorsed in *W.C. v. HHS*, combines elements from previous Federal Circuit decisions. *W.C. v. HHS*, 704 F.3d at 1357 ("The *Loving* test combines the first three *Whitecotton* factors, which establish significant aggravation, with the *Althen* factors, which establish causation.") Since the last three elements of the *Loving* test include the entirety of the *Althen* test, with insignificant wording modifications, the analysis of those three elements would be the same using either standard.

2. Analysis of this case, under the six-part Loving/Althen test

In this Section, I will discuss why Petitioner has failed to satisfy the six-part *Loving* test to establish the existence of vaccine-related *significant aggravation* of a preexisting condition.

a. What was G.C.F.'s condition prior to the administration of the vaccinations in question?

As explained in Section VII above, on July 2, 2012, much of G.C.F.'s development seemed normal. However, with the benefit of *hindsight*, the evidence indicates that G.C.F. had already displayed several symptoms of an autistic spectrum disorder *prior* to that date. (See discussion at Section VII, above.)

b. What was G.C.F.'s condition "following" the vaccination in question, and what is his current condition?

As explained above (Section XI(B)), the evidence in this case indicates that G.C.F. did *not* suffer any sharp increase in autistic symptoms in the first *three weeks* after his MMR vaccination of July 2, 2012. However, as also explained in Section XI(B), he clearly did suffer a substantial increase during the *three months* after that vaccination. Therefore, I find that G.C.F.'s condition *three weeks* after the vaccination was *substantially unchanged* from his pre-vaccination condition with respect to autistic symptoms, but significantly worse by *three months* after vaccination.

Further, by January of 2013, six months after the vaccination in question, G.C.F. was formally diagnosed with autism. (Ex. 5, p. 22.) Tragically, since then G.C.F. has proved to have a very significant neurodevelopmental disorder, which has been classified as an Autism Spectrum Disorder -- that is his "current condition."

c. G.C.F.'s disorder legally constitutes a "significant aggravation" of his autism spectrum disorder.

As explained in the prior paragraph, I would have to *reject* any allegation that G.C.F.'s disorder significantly worsened within *three weeks after* the vaccination in question. However, his disorder had significantly worsened by *three months* after that vaccination. Further, in the *Loving/Althen* formulation set forth in *W.C.* and quoted above, another question posed is whether the vaccinee's *current condition* constitutes a "significant aggravation" of the vaccinee's condition prior to vaccination. *W.C.*, 704 F.3d at 1357. And as to that question, my conclusion is that G.C.F.'s "current condition" *is* significantly worse than his condition appeared immediately prior to the vaccination in question. Therefore, following the standard set forth in *Loving* and *W.C.*, G.C.F.'s condition three months post-vaccination and his "current condition" both do amount to a "significantly aggravation" of his pre-existing autism spectrum disorder -- though the worsening has definitely *not* been shown to have been related to his vaccination.

d. Petitioner has failed to establish Prong 4 of Loving/Prong 1 of Althen.

As discussed above, Prongs 4, 5, and 6 of the *Loving* test are, in effect, the same as Prongs 1, 2, and 3 of the *Althen* standard. Under Prong 4 of *Loving* and Prong 1 of *Althen*, a petitioner must provide a medical theory demonstrating that the *type* of vaccine in question can cause a significant worsening of the *type* of preexisting condition of the vaccinee. In this case, however, for the reasons stated above, in Sections VIII, IX, and XI, the Petitioner has *failed* to show that the vaccination in question *can* aggravate an autism spectrum disorder. As explained in Section XI above, Dr. Shafrir did not provide *any explanation at all* as to why or how he believes that an MMR vaccination could worsen an autism spectrum disorder.

Accordingly, Petitioner has wholly *failed* to establish Prong 4 of *Loving*/Prong 1 of *Althen* in this case.

e. Petitioner has failed to establish Prong 5 of Loving/Prong 2 of Althen in this case.

Under Prong 5 of *Loving*/Prong 2 of *Althen*, the Petitioner needs to show that it is "more probable than not" that G.C.F.'s MMR vaccination of July 2, 2012, *did* aggravate the autism spectrum disorder of *G.C.F. himself*. But she has failed to do so. As explained at Section XI above, Dr. Shafrir did not give any explanation at all of why or how the MMR vaccination in question might have aggravated G.C.F.'s own disorder.

Accordingly, Petitioner has failed to establish Prong 5 of *Loving*/Prong 2 of *Althen* in this case.

f. Petitioner has failed to establish Prong 6 of Loving/Prong 3 of Althen in this case.

Since I have explained why Petitioners have failed to satisfy the *first* and *second* prongs of *Althen* (4th and 5th prongs of *Loving*), I need not discuss why Petitioner's case also fails to satisfy the Prong 3 of *Althen*/Prong 6 of *Loving*. However, again in the interest of completeness, I will analyze whether there was "a showing of a proximate temporal relationship" between the MMR vaccination and the worsening of G.C.F.'s autism spectrum disorder.

As explained above, the medical records, specifically the notes of G.C.F.'s visit of July 24, 2012, indicate that G.C.F.'s autism symptoms did *not* suddenly worsen within *three weeks* of his MMR vaccination of July 2, 2012. On the other hand, the record of October 3, 2012, shows that his symptoms *did* substantially worsen within *three months* of that vaccination. However, since Dr. Shafrir *never explained* his one-word "significant aggravation" claim, he never stated whether he believes that a worsening within *three months* would constitute a sufficient "proximate temporal relationship" to indicate that the vaccination was responsible for that worsening. Therefore, Petitioner has also failed to establish Prong 6 of *Loving*/Prong 3 of *Althen* as to Petitioner's significant aggravation claim.

g. Summary concerning Althen/Loving test.

Having failed to establish Prongs 4, 5, and 6 of the *Loving* test, Petitioner has failed to prove her "significant aggravation" claim in this case.

C. This not a close case.

As noted above, in *Althen*, the Federal Circuit indicated that the Vaccine Act involves a "system created by Congress, in which close calls regarding causation are resolved in favor of injured claimants." *Althen*, 418 F.3d at 1280. Accordingly, I note here that this case is ultimately *not* a close call. For all the reasons set forth above, I find that Dr. Shafrir's causation theory was quite speculative, while Respondent's expert was far more persuasive.[27]

XII

CONCLUSION

The record of this case demonstrates plainly that G.C.F. has suffered a tragic medical disorder. Thus, I feel deep sympathy for G.C.F. and his mother. Further, I find it unfortunate that my ruling in this case means the Program will not be able to provide funds to assist this family, in caring for a child who suffers from a serious disorder. However, I must decide this case not on sentiment, but by analyzing the evidence. Congress designed the Program to compensate only the families of individuals whose injuries or deaths can be linked causally,

[27] It should be noted that in this case the Petitioner never came close to carrying her burden of making a "*prima facie*" case showing that G.C.F. suffered a vaccine-caused or vaccine-aggravated injury. Therefore, the burden *never shifted* to Respondent to demonstrate that G.C.F.'s disorder was "due to factors unrelated to the administration of the vaccine." §300aa-13(a)(1)(B).

either by Table Injury or presumption or by preponderance of "causation-in-fact" evidence, to a listed vaccine. In this case, the evidence advanced by Petitioner has fallen far short of demonstrating such a link. Accordingly, I conclude that the Petitioner in this case is *not* entitled to a Program award on G.C.F.'s behalf.[28]

IT IS SO ORDERED.

/s/ George L. Hastings, Jr.
George L. Hastings, Jr.
Special Master

[28] In the absence of a timely-filed motion for review of this Decision, the Clerk of the Court shall enter judgment accordingly.